

# Lunch and Learn Project Guide



THE PEGGY NOTEBAERT  
**NATURE MUSEUM**  
*The Museum of the Chicago Academy of Sciences*



**PROJECT NAME:** Lunch and Learn

**PROJECT FOCUS:** Greening the cafeteria

**INTRODUCTION:** Food may travel a long distance between the field and the school cafeteria, and at every step along the way, there are environmental impacts. Food that is not grown organically may require the application of pesticides and fertilizers that have negative effects on air and water quality, and, in turn, on human health. In addition, some food items travel thousands of miles from where they are grown to where they are eventually eaten. Processing, storing, and transporting food are all processes that consume energy and fuel, and contribute to greenhouse gas emissions. Even after it makes its way to the consumer, food continues to affect the environment. In the United States, over a pound of food per person per day is thrown away, generating tens of millions of tons of food waste per year. Some of that food waste makes its way to landfills where it releases methane as it rots, further contributing to greenhouse gas emissions.

Students participating in this project will work with their school cafeteria and fellow students to address the environmental problem of our food choices. The steps of the project parallel the steps in the food system life cycle, from origin and production, to transportation, processing, and packaging, to, finally, consumption and disposal. At each step, Club members will identify ways that their school and cafeteria can reduce food waste. Club members will conduct a cafeteria food waste audit, then use what they learn to implement a new recycling/waste management plan. By growing herbs and vegetables in the classroom and by vermicomposting, Club members will participate directly in food production and responsible disposal. Finally, Club members will share their creative solutions for reducing the school's food waste with other students through a Lunch & Learn series of presentations in their cafeteria.

## **MATERIALS:**

### **General C3 Club Action Project supplies:**

- 4 packs of low-odor markers
- 1 ream of assorted recycled paper (8.5" x 11")
- 10 recycled-paper posterboards
- 2 rolls of tape
- C3 Club Network Supplies (*distributed at Kickoff Meeting on 9/8 or 9/9*)

### **Project-specific materials (provided):**

#### For Phase I:

- disposable gloves
- tarp
- blue bags
- trash bags
- scale

#### For Phase II:

- bag of Flamin' Hots
- 2 vermicomposting bins (and two pounds of red wiggler worms)
- classroom container gardening supplies (seed packets and mini greenhouse)
- 2 large recycling totes (to be delivered directly to school)

#### For Phase III:

- C3 reusable lunchboxes (made from recycled materials)
- compostable forks

#### For Phase IV:

- disposable gloves
- tarp (from phase I)
- blue bags
- trash bags
- scale (from Phase I)

### **Materials for teacher to provide:**

- newspapers
- recycled containers (milk jugs, carry-out containers, etc.)
- calculators

## OBJECTIVES:

1. Conduct a waste audit of the cafeteria, and design a greener cafeteria based on your findings.
2. Grow a Pizza Garden in the classroom, using the compost from your Club's vermicompost bin.
3. Reduce cafeteria waste from Club members and the rest of the school by: inspiring sustainable food choices, the use of reusable containers, recycling packaging, and composting food materials.
4. Host a Lunch-and-Learn series to inform students and staff at the school about ways they can reduce food waste. Distribute lunchboxes and compostable utensils to students, and collect pledges to reduce food waste.
5. Build support at your school for ongoing efforts to green the cafeteria.

## PERFORMANCE MEASURES:

The success of your project will be tracked with several performance measures. These measures are designed so that you will have quantitative successes to report at the end of your project. Part of Phase I: ("Learn") is to audit the current status of these measures at your school, then to set goals to accomplish by the end of the year. In Phase IV ("Thinking Back & Looking Ahead"), you will re-assess the situation to track the difference that your project has made.

	<b>Performance Measure</b>	<b>Current Amount</b> (measure during Phase I)	<b>End-of-the-Year Goals</b> (set during Phase I)	<b>Final Amounts</b> (measure during Phase IV)
1	Number of students actively involved in your C3 Club			
2	Number of students who participated in the Lunch & Learn events			
3	Number of lunchboxes distributed			
5	Number of food waste reduction pledges signed			
6	Pounds of food diverted from the waste stream through composting			
7	Pounds of compost harvested from worm composting			

## PROJECT TIMELINE, MILESTONES, AND REPORTING:

This timeline is designed to give you milestones to guide you in your project development, implementation, and evaluation. At the end of each project phase, you will submit an online report (4 total reports), where you will sign off on having completed each of the milestones below. Remember that this timeline is just a starting point to plan your project, which you will tailor to address the needs of your individual school community. Please note that if you have extra time as you work on your project, we encourage you to work ahead on future project milestones.

To fill out your online report, sign in to the “C3 Teachers” section of the blog at [www.chicagoconservationcorps.org](http://www.chicagoconservationcorps.org). Please be sure to submit your report on time, even if you have not yet completed all of the milestones. Remember that teacher stipend checks are contingent on the timely completion of reports. Due dates are listed for each phase.

### **Phase I: Learn**

October 12 – December 10

***Online Report Due: Friday, December 10***

- MILESTONE #1: Get **permission** from the principal to conduct the audit.
- MILESTONE #2: **Organize** the Club for the lunchroom waste audit.
- MILESTONE #3: Conduct a **waste audit** of the lunchroom.
- MILESTONE #4: Fill out **performance measure amounts** for “Current Amount” and set “End-of-the-Year Goals.”
- MILESTONE #5: **Meet with administration** to update them on project plans and goals, and to ask for their support.
- MILESTONE #6: **Complete Online Report:** Due December 10.

## Phase I Procedures

- Read through the steps outlined for Phase I, and contact C3 with any questions. Please note: These milestones can be adapted so that they most effectively meet the needs of your individual school community; however, please communicate any major changes to C3 staff early on in the process.**

**MILESTONE #1: Get permission from the principal to conduct the audit (teacher preparation at least one week before the first Club Lunch and Learn meeting).**

- Describe the procedure for the lunchroom waste audit to the appropriate members of your administration.** You may use (and modify, if necessary) C3's sample memo and/or list of key talking points regarding the lunchroom waste audit when contacting administrators at your school. Determine whether your school administration is opposed to the lunchroom waste audit. If your school administration is not opposed to the waste audit, continue to the next step. If your school administration is opposed to the waste audit, then follow the procedures in the Alternative Lunchroom Waste Audit in the Appendix for Milestones #3 and #4.
- Choose a date and location to conduct the audit.** Ideally, the audit will take place immediately after school, and in a parking lot or other similar location where bags of waste can be spread out on plastic tarps. The location should also be one at which the students can post signs the day before the audit is to take place.
- Ensure that the teachers and staff responsible for the lunchroom understand and approve of the waste audit project.** If it is possible for teachers, staff, or C3 students to facilitate the sorting of lunchroom waste on the day of the audit, then the audit will be easier to conduct. You may use and modify C3's sample memo to help explain the audit to teachers and staff.
- Explain the waste audit to your school custodians and/or building manager.** Make sure they understand that on the day of the lunchroom waste audit, students will be collecting and disposing of trash and recyclables from the lunchroom. You may use and modify C3's sample memo to help explain the audit to custodians. If cafeteria staff and/or custodians express interest in the project, ask if they would be willing to share their expertise and experiences with Club members.

**MILESTONE #2: Organize the Club for the lunchroom waste audit. (2 meetings)**

- Send permission slips home if necessary.** C3 has provided a sample permission slip (see Appendix) that you can edit to meet your needs.
- Lead a discussion about the connection between global climate change and the school cafeteria.** Use the fact sheet in the Appendix to introduce the concept of the food system. Give Club members a preview of the aspects of the food system that they will cover, as they relate to the school cafeteria. This will provide context for how the school cafeteria fits into the food system, and how the food system relates to human-caused climate change.

- Conduct a brief reconnaissance mission to the cafeteria.** Check the existing waste disposal and recycling capacity of the cafeteria. Does the cafeteria have bins to separate food waste from recyclables? Are there facilities for washing reusable trays, plates, and utensils, or are disposable trays, plates, and utensils used? Does all trash go into the same bin? If cafeteria staff and/or custodians had previously expressed interest in the project, ask if they would be willing to lead the cafeteria tour and explain the “behind-the-scenes” food waste disposal processes to the Club.
- Decide on the details.** Keeping in mind what was learned from the tour of the cafeteria, decide on the details for the lunchroom waste audit. The following are some questions to consider. How many receptacles will you need? Where should the receptacles be placed in the cafeteria? Are there any other locations where students eat lunch that should also have receptacles? Is there any reason to separate the waste by lunch period? by grade? Will it be sufficient to collect trash from only one lunch period and extrapolate to all lunch periods?
- Announce the lunchroom waste audit to the school.** Make posters to place in the lunchroom and any other appropriate areas to announce the upcoming lunchroom waste audit, and to ask students and teachers to assist by sorting their waste (if possible) on the day of the audit.
- Set up bins for collecting wet, dry, and recyclable materials during the lunchroom waste audit.** Set up at least two – and more if the volume of trash produced is greater – receptacles, one for wet trash (food and liquids) and one for dry waste (packaging, paper, napkins, etc.). You can use receptacles available in the cafeteria and add labels and trash liners as necessary. If your school already has recycling bins in the cafeteria, then students should use them as usual on the day of the audit. If the school does not currently use recycling bins, then do not set up a separate bin for the purposes of the audit (recyclables can be placed in the dry waste receptacle). Make sure that the bins are in place and empty on the morning of the audit.
- Make labels for each receptacle showing the kind of waste that should be placed in it.** Make signs for each receptacle location in the cafeteria to explain the audit. Include examples of the wet and dry waste on the signs to make sorting easier for students. Designate Club members to place labels on receptacles, and signs above receptacles, either at the end of the day before the audit or first thing in the morning on the day of the audit.

Examples of dry waste	Examples of wet waste
<ul style="list-style-type: none"> <li>• Candy wrappers (and any other kinds of wrappers)</li> <li>• Empty potato chip bags</li> <li>• Lunch bags</li> <li>• Bakery containers</li> <li>• Empty soda or water bottles</li> <li>• Any type of paper, plastic wrap, or packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Leftover lunch items such as: sandwiches, fruit, yogurt, cheese, chips, bread, soup, and milk</li> <li>• Paper trays with leftover food on them</li> <li>• Used paper towels, napkins, and tissues</li> </ul>

- Ask for volunteers or appoint sorting captains for the day of the audit.** Club members will take responsibility for being stationed at the waste receptacles on the day of the audit to help students sort their lunch waste properly during the lunch period.
- Depending on the size of the Club, **divide students into teams for the day of the audit.** If appropriate, teams can be assigned for collecting the containers and taking them to the sorting area, sorting, weighing waste, etc.
- Coach students on safety procedures.** You may want to set your own rules, but here are some suggestions:
  - Students should bring a pair of old shoes and a change of clothes or an old t-shirt for the activity.
  - Wear gloves at all times when handling trash.
  - Avoid touching wet waste or any unsanitary trash.

### **MILESTONE #3: Conduct a waste audit of the lunchroom. (1 meeting)**

- Conduct a final audit preparation check.** The morning before the audit, make sure that the receptacles are in place in the lunchroom, and that the signs and receptacle labels are on display. Remind teachers and students that they should separate their cafeteria trash that day at lunch.
- Get into gear for the audit.** Distribute gloves to each student. Ask students to change into old clothing and shoes.
- Set up the sorting space** in a parking lot or other outdoor surface. Lay out the tarp, and designate areas for the collected dry and wet waste receptacles, and for recyclable materials if applicable.
- Ask students to **collect the wet and dry waste receptacles** (and recycling bins) from the cafeteria.
- Tie the bags of wet waste closed and weigh them.** Do a quick visual check of the wet waste. How many visible items appear to be untouched food? Record untouched food estimates on Waste Audit Worksheet #1 (see Appendix). Record the weight of each bag (using your hanging scale). If receptacles were organized by location in the lunchroom or by lunch period, also record the location or lunch period from which the receptacle was collected. When finished, throw the bags of wet waste in the dumpster.
- Sort the dry waste bags.** Leave the bags of dry waste open, and weigh each bag. Record the weight on Worksheet #1, along with the location or lunch period, if necessary. Next, sort through the bags of dry waste, separating the items into the categories indicated on Worksheet #2. Weigh how much of each type of item was collected and record the weights. When finished, dispose of the dry waste in the dumpster. If you found any recyclable items were placed in the dry waste bin, place these items in the recycling dumpster.

- If possible, sort the recycling bins** in the same manner as the dry waste bags were sorted. Record all appropriate information on Worksheet #2.
- Clean up.** Make sure all waste and recyclables are in the correct bins, and the sorting area is as clean as it was before the audit. Return all receptacles to their appropriate locations.

**MILESTONE #4: Fill out performance measure amounts for “Current Amount” and set numbers for “End-of-the-Year Goals.” (½ meeting)**

- Compile the results of your audit.** Take the results recorded on any individual worksheets, and compile all of them onto one worksheet.
- Extrapolate the data.** If waste was collected from only one lunch period, multiply the results by the total number of lunch periods in a day to estimate the school’s daily lunchroom waste production. Multiply the daily lunchroom waste values by the total number of school days in a year (use Waste Audit Worksheet #3 as a guide – see Appendix)
- Discuss the results with the Club.** Ask a student to take notes during the discussion. The following are some questions that can be used to stimulate discussion.
  - What were the five most common materials you found in the trash?
  - Was there more food waste, or more food packaging waste?
  - What comments and questions did the sorting captains hear on the day of the lunchroom waste audit?
  - Approximately what percentage of recyclables was placed in the proper bin? What percentage was mixed in with the trash?
  - What are some alternative methods of disposing of the materials that you found in the trash? What could have been recycled, reused, or composted? (use Waste Audit Worksheet #4 as a guide – see Appendix.)
- Develop a Top 10 list.** Based on what the Club members have learned about food waste and what they found from the lunchroom waste audit, make a list of the top 10 key findings and/or priorities for reducing lunchroom waste. Have one of the students record the list so that it can be presented to school administration and staff.

**MILESTONE #5: Meet with administration to update them on the project plans and goals, and to ask for their support. (½ meeting or outside of meeting time)**

- Invite guests (administration, teachers, other students, etc.) to your next Club meeting.** Have Club members present the lunchroom waste audit and the Top 10 list of interesting findings from the waste audit and/or priorities for reducing lunchroom waste that they have identified so far. Ask for reactions, feedback, and ideas from staff. *Note: If dishwashers were present but unused in the cafeteria, your Club may want to bring this up with the principal. New CPS policy states that any school with a functional dishwasher should be using that dishwasher with reusable trays. Please work with your Lunch Room Manager to implement this in your cafeteria.*

OR

- Update the administration and staff about your progress.** If administration and staff are unable to attend a Club meeting, pass on the key findings from the waste audit to keep them updated about the Club's progress.

**MILESTONE #6: Complete online report for Phase I, due Friday, December 4.**

## **Phase II: Act**

December 13 – March 4

***Online Report Due: Friday, March 4***

- MILESTONE #7:** Calculate the **greenhouse gas emissions** associated with a favorite food item.
- MILESTONE #8:** Set up **vermicomposting** for lunchroom scraps.
- MILESTONE #9:** Set up a classroom **container garden** and begin growing your Pizza Garden.
- MILESTONE #10:** Develop plans to **improve recycling** in the lunchroom.
- MILESTONE #11:** Start **planning your Lunch & Learn series.**
- MILESTONE #12: Complete Online Report:** Due March 4.

## **Phase II Procedures**

- Read through the steps outlined for Phase II, and contact C3 with any questions. Please note: These milestones can be adapted so that they most effectively meet the needs of your individual school community; however, please communicate any major changes to C3 staff early on in the process.**
- Obtain administrative approvals as needed.** It may be necessary to obtain administrative approval for the activities listed under Milestone 8 (indoor vermicomposting) and Milestone 10 (improve lunchroom recycling). Speak with the appropriate school officials to make sure that these activities are permitted.

**MILESTONE #7: Calculate the greenhouse gas emissions associated with a favorite food item. (1 meeting)**

- Conduct a food biology and chemistry investigation.** During this meeting, Club members will learn about the production aspects of the food system. Using bags of the popular snack food “Flamin’ Hot” Cheetos and the Food Matching Game (see Appendix), have students guess the plant, animal, or other source for the ingredients found in Flamin’ Hots (and many other popular snack foods). What ingredients’ sources are surprising to the Club members? Club members can also search the library and internet for the sources of ingredients not listed on the matching game.
- Calculate the environmental costs of the Club members’ favorite cafeteria meal.** Take a vote on the Club’s favorite meal in the cafeteria. Use the Geographic Origins of Food Guide (see Appendix) to find how far one of the meal’s produce components travelled, then calculate the total miles traveled and the total carbon dioxide emitted as a result of transporting the food. Students can also research the geographic origins of their favorite foods on the internet to find out where they grow, and how far they have to travel to get to their plate.

**MILESTONE #8: Set up vermicomposting for lunchroom scraps. (2 meetings + ongoing weekly)**

- Learn about vermicomposting.** Give Club members five minutes to think of every compostable item they can from the last month of school lunches. If there are any disagreements or items about which you and the Club members are uncertain, search for information on the internet and refer to the Worms Ate My Lunch project guide.
- Read through the entire procedure for worm composting in the Worms Ate My Lunch project guide.** The procedures outlined here contain the basic information for setting up your Club’s vermicomposting bins.
- Consult with administrators and building engineers** to ensure that keeping worm composting bins in the school is appropriate. Remind them that the bins will not smell or attract pests if they are maintained properly, and outline your plan for maintaining the bins. Locate a drill to make holes in the worm bins at the following meeting.
- Review the vermicomposting procedures with Club members,** and discuss the importance and value of composting (see some of the materials on the Additional Resources list at the end of the Worms Ate My Lunch project guide for more information). Have Club members bring newspaper (no color or glossy pages) to the following meeting. This will serve as bedding for the worm bins.
- Prepare the worm bins.** Use the 1/16-inch bit to drill ventilation holes 1 to 1.5 inches apart along the side of the bins, close to the top, and drill 8-10 additional holes in the top of the bins. Tear the newspaper collected by Club members into long 1”-wide strips. Fill in the bins with the strips, but don’t pack it. Add water to moisten the paper just enough to be as damp as a wrung-out sponge.

- **Feed the worms.** Follow the guidelines in the Worms Ate My Lunch project guide for ordering the worms once the bin is ready. Determine a schedule for feeding the worms with the right kind of food scraps (about ½ pound of food per day per bin), and have students collect compostable materials accordingly. Food scraps for the worms can be collected by Club members after their own lunches or could be collected from several students in the cafeteria, collected from the teachers' lounge, or brought by students from home. Club members may also check with cafeteria staff to obtain unservable or overripe fruit.
- **Maintain the worms.** Have Club members observe and record the amount of food composted on the "Worm Bin Observation Sheet" (see Appendix) in order to record the amount of food waste diverted from the landfill by the Club's composting efforts – one of your performance measures. Additionally, Club members should keep an eye on the status of the worm bins, and refer to the Worms Ate My Lunch project guide troubleshooting section if any problems arise.
- **Harvest your compost for your Pizza Garden.** Remove any excess liquid from the worm bins to keep the worms from drowning. This liquid is known as "worm tea" or "compost tea," and is an excellent - although strong - fertilizer. The compost tea can be diluted and used to fertilize the Pizza Garden. As it becomes available (after two- to six- months), harvest the compost, and add it to the potted plants in the classroom container garden (see Milestone #9). Compost can be harvested by scooping it out of the top layer of the bin after leaving the top off for a few minutes, or by pushing the compost to one side of the bin and the fresh bedding to the other and allowing the worms to migrate to the fresh side. If the compost is ready before the classroom container garden is planted, the compost can be mixed with potting soil. Otherwise, sprinkle compost around the bases of the container garden plants. Also, be sure to record the amount of compost that you harvest, and record it on the Observation sheet.

**MILESTONE #9: Set up classroom mini-greenhouse and begin growing the Pizza Garden. (2 meetings + ongoing weekly)**

- **Learn about local food and farm-to-cafeteria programs.** Using the Farm-to-School program website (see Online Resources), introduce Club members to the concept of local food. The website contains a map with links to farm-to-cafeteria programs throughout the United States - including several right here in the Chicago area. In the past year, Chartwells has purchased nearly \$2.5 million dollars worth of regional produce. Discuss why this is important and see if there is an urban farm or garden in the school's neighborhood that your club can visit.
- **Setup mini greenhouse.** Use milk jugs and 2-liter bottles with the tops cut off as containers for growing classroom plants. If needed, have Club members bring reused containers that they think will work as pots to a Club meeting. Ideally, drainage holes can be placed in the bottoms of the containers, and the containers can rest in shallow dishes to catch any excess water that seeps out of the holes. Prepare the containers you will use, and recycle the rest.

- Set up a space with everything plants need to grow.** Choose a location with ample sunlight, in an available classroom, lab, or Club meeting area, to set up the greenhouse to grow your Pizza Garden. Ideally, this space will be relatively warm, and will not experience large temperature fluctuations, for example, over the weekends.
- Plant the seeds.** Follow the directions for planting the seeds as closely as possible. Have Club members read directions on the seed packets for sowing and growing the seeds, and lead other Club members in setting up pots for the herbs and vegetables. Check the guidelines for watering the seeds.
- Assign plant care responsibilities.** With Club members, determine a schedule for taking care of the growing plants. Use the watering guidelines on the seed packets to determine the frequency with which students should check on and water the plants. While watering plants, Club members should also check to see whether the plants are free of pests and looking healthy.
- Eat the plants!** When appropriate, harvest the plants and enjoy the fruits (or leaves or stems...) of your labors. Many herbs and other agricultural plants will not be harmed by harvesting small portions of the plants. Club members can take home plants once they are ready to eat. Note that if the Club is planning to grow herbs for a fundraiser, this part of the project will serve as a test to determine how fast the plants grow and how many they will need in the future.

**MILESTONE #10: Develop plans to improve recycling in the lunchroom.  
(3 meetings)**

- Brainstorm ways to improve recycling in the lunchroom.** Now that the Club members have learned about the current state of recycling in the cafeteria, they can think of ways to improve it. Using the food system as a framework for your discussion, have Club members fill in the successes they have already accomplished under each part of the food system (production, processing and packaging, transportation, consumption, and disposal). The vermicomposting and food redistribution components of the project are part of the solution, and Club members can likely think of other actions that have already had impacts. Next, have students brainstorm ways they can continue to reduce food waste, focusing on recycling and reuse. If students need some prompting, try out some of the ideas in the Supplemental Project Ideas for the Land and Waste Unit of Year One Clubs.
- Choose the most effective and realistic way to reduce waste in the lunchroom, using available materials.** From the ideas proposed by Club members, have the Club vote on the best idea that uses materials available to them.
- Order recycling bins from C3.** As part of your project materials package, you are eligible to receive two large rolling recycling totes. The totes can either be used for

collection, or you can cut a bottle-sized hole in the top for it to serve as a lunchroom recycling receptacle. If you would like to receive the bins, you must notify C3 by Monday, December 13<sup>th</sup> by sending an e-mail to [conservation@cityofchicago.org](mailto:conservation@cityofchicago.org). The bins will be delivered directly to your school, addressed to your attention.

- Write a proposal for improving recycling in the lunchroom.** Based on the discussion about the chosen recycling plan, have Club members write a proposal to the school's administration in which they detail their plans, and explain why their plan is cost-effective and realistic. The plan should include a way to measure the success of the program – for example, by recording the amount of materials recycled because of it.
- Present your proposal to the appropriate administration and staff.** Invite members of the administration to attend the Club's next meeting; have Club members present their proposal to the administration. Moderate a discussion about whether the entire plan, or aspects of it, can be implemented in the school cafeteria.
- Design signage to help students use the new recycling design.** Following approval of the plan, Club members should design signage to promote recycling in the cafeteria. They can use standard art materials and incorporate recyclable or reused materials into the signs.
- Implement the recycling improvements.** During a Club meeting, hang the signs and set up any recycling materials that are part of the Club's plan.

#### **MILESTONE #11: Start planning the Lunch & Learn series. (2 meetings)**

- Brainstorm topics for the Lunch & Learn series.** Club members will present their solutions for reducing food waste to the students at their school through a Lunch & Learn series held in the cafeteria during lunch. The topics should highlight the accomplishments of the Club during Phase II, and should make use of the materials available. Suggested topics for the Lunch & Learn series include: classroom container gardening (tomatoes, herbs, etc.), vermicomposting, findings from the food transportation CO<sub>2</sub> emissions, lunchbox distribution and food packaging awareness, compostable materials distribution, food sources (geographic locations and pictures of plants and animals), or an organic foods taste test (can students tell a conventionally grown apple from an organically grown apple?). The number of topics chosen for the Lunch & Learn series will depend on the Club members' available time.
- Group the topics on the list into their place in the food system.** One possible way to structure the Lunch & Learn series is to choose topics that parallel the steps of the food system. That is, you may wish to pick one topic for each of the following: production, processing and packaging, transportation, consumption, and disposal.
- Discuss which topics would make the best hands-on demonstrations for the Lunch & Learn series.** From the potential topics in the brainstorm, discuss which would work best for brief (5-10 minute), informal presentations in the cafeteria during

a lunch period. It may be possible to combine some of the ideas from the brainstorming session into one presentation.

**MILESTONE #12: Complete online report for Phase II, due Friday, March 4.**

### **Phase III: Make a Difference**

March 8 - April 29

***Online Report Due: Friday, April 29***

- MILESTONE #13: **Plan** the Lunch & Learn events.
  
- MILESTONE #14: **Implement** the Lunch & Learn events.
  
- MILESTONE #15: **Collect pledges** to reduce food waste at the school.
  
- MILESTONE #16: **Complete Online Report:** Due Friday April 29.

### **Phase III Procedures**

- Read through the steps outlined for Phase III, and contact C3 with any questions. Please note: These milestones can be adapted so that they most effectively meet the needs of your individual school community; however, please communicate any major changes to C3 staff early on in the process.**

**MILESTONE #13: Plan the Lunch & Learn events. (3 meetings)**

- Assign presentation teams for each topic.** Club members should form Lunch & Learn teams to present each of the topics chosen. They can meet during the Club meeting time, during lunch if their schedules allow, and/or outside of Club meeting time as necessary to discuss plans.
  
- Plan the presentations.** Allow for at least one Club meeting for teams to meet and discuss their presentation plans. These plans should include: how to explain the topic, what materials should be used in a demonstration or hands-on activity related to the topic, whether they will make something to hand out to participants (a fact sheet, game, list of online resources, etc.), and how to promote the Lunch & Learn series to other students. Club members can determine the type of presentations to do based on members' skills and interests, but the Lunch & Learn events need not be formal. In fact, many topics lend themselves to very informal, relatively brief, presentations. These presentations might take the form of having a table set up outside the cafeteria for students to walk by and learn on their way to lunch.

Nevertheless, preparation will make the experience more effective and enjoyable for Club members.

- Gather and prepare materials for the presentations.** Have Club members determine what they will need for their Lunch & Learn activities. Once they have clear plans for what they plan to present (and how they plan to present it), have Club members collect and prepare their materials. Don't forget to use as many of the materials provided by C3 as possible!
- Practice the presentations with the Club.** Set aside another Club meeting for the teams to practice their presentations. Each team should lead their Lunch & Learn presentation for the rest of the Club members just as they would lead it for other students in the cafeteria. Club members should provide feedback to the teams leading each presentation. From your practice, identify what works – and what still needs some work – before the presentations in the cafeteria.
- Schedule the presentations.** Determine the dates and lunch periods for each Lunch & Learn event, and make sure that Club members will be available during these times to lead their presentations.
- Advertise the presentations.** Club members will make signs to promote the Lunch & Learn series to other students. They should place the signs in the cafeteria and any other appropriate locations at least a week prior to the first Lunch & Learn series. In addition, explore other ways to promote the series, such as through home room announcements, or asking science teachers to talk about the series in their classes.
- Design food waste reduction pledges for Lunch & Learn participants to sign (see Milestone #15).** The pledges could contain a checklist of ways individual students can reduce food waste, using suggestions from the Lunch & Learn series. Some ideas for pledges are: eating a local meal once a week, growing food in a container at home, replacing disposable containers with reusable ones, or promising to eat zero-waste lunches every day. The pledge sheets should leave a space for each student to decorate their pledge or write a unique pledge of their own. Make enough copies of the blank pledges to distribute at the Lunch & Learn events.

#### **MILESTONE #14: Implement the Lunch & Learn events. (1 meeting + lunch times)**

- Conduct Lunch & Learn events.** Club members will conduct the Lunch & Learn events during lunch periods as scheduled. Make sure that teams have all of the materials they need, and return the materials when they are finished. Collect pledges signed by Lunch & Learn participants.
- Hold a Lunch & Learn debrief.** During a Club meeting, have each team tell the rest of the Club about their experience and their successes. Celebrate completion of this phase of the project by totaling the number of pledges signed and the number of students who attended the Lunch & Learn series.

#### **MILESTONE #15: Collect pledges to reduce food waste at the school. (1 meeting + lunch times)**

- Collect pledges during the Lunch & Learn events.**
- If necessary, petition for additional pledges during lunch periods.** If the Club feels that they could collect more pledges by circulating them during additional lunch periods or working with other teachers to share the pledges with their classes, then make plans to expand the pledge program.
- Post the pledges.** In the cafeteria or another suitable space, display the signed food waste reduction pledges. The pledges would make a good backdrop for a Club photo. Consider printing the names of the students who signed the pledges in the school newspaper.
- Report the pledges to administration and staff.** Meet with administration and staff to share the successes of the project with them. If you will be taking a Club photo with the pledges, you can invite the administration and staff who have participated in your project to join you.

**MILESTONE #16: Complete online report for Phase III, due Friday, April 29.**

### **Phase IV: Thinking Back & Looking Ahead**

May 2 – May 27

***Online Report Due: Friday, May 27***

- MILESTONE #17: Re-conduct the waste audit of the lunchroom
- MILESTONE #18: Fill performance measure amounts for “Final Amount”
- MILESTONE #19: Reflect and plan ahead for future projects
- MILESTONE #20: **Complete Online Report:** Due Friday, May 27

### **Phase IV Procedures**

- Read through the steps outlined for Phase IV, and contact C3 with any questions. Please note: These milestones can be adapted so that they most effectively meet the needs of your individual school community; however, please communicate any major changes to C3 staff early on in the process.**

**MILESTONE #17: Re-conduct the waste audit of the lunchroom. (1-2 meetings)**

- Following procedures from Phase I, re-conduct the lunchroom waste audit.**

**MILESTONE #18: Fill performance measure amounts for “Final Amount.” (2 meetings)**

- Analyze the findings from the second lunchroom waste audit.** Following the guidelines in Phase I, analyze the Club’s findings from the second lunchroom waste audit. Be sure to include the waste reduced by the Club’s new recycling and composting plan in the calculations.
- Calculate the waste reduced outside of the cafeteria as a result of composting and food waste reduction pledges.** Total the pounds of food waste composted by Club members. If possible, estimate the pounds of food waste that will be diverted from the landfill or the greenhouse gas emissions that will be reduced based on the pledges.
- Work out three “greening the cafeteria” scenarios.** Determine the total “business as usual” waste, based on the initial cafeteria audit. Next, calculate the waste reduced through Club activities and student pledges during this year’s project. Next, calculate the ideal scenario – how much waste would be reduced if everyone in the school followed all of the Club’s recommendations from the Lunch & Learn project?
- Present your findings.** Create a banner or poster to hang in the cafeteria that summarizes all of the successes of the Club and the school through the Lunch & Learn project. Display the findings from the three scenarios, and challenge students to keep up the good work.

**MILESTONE #19: Reflect and plan ahead for future projects. (1 meeting and ongoing)**

- Take time to celebrate.** Review the accomplishments of the Club, and celebrate with a green celebration. Have Club members plan a Lunch & Learn wrap-up party during a Club meeting, at which they can use reusable containers, compost the food, request local food donations, etc. Eat food grown in the classroom container garden, and send seeds and leftover plants home with those who participated in the Club activities. Invite members of the administration, staff, and parents who helped with the project along the way.
- Think big!** If your Club is inspired to continue on with the project, here are some ideas to extend it. Through Greencorps Chicago, establish a school garden. Take a guided tour of City Farm, or visit the Green City Market. Invite a local farmer (for example, someone from Angelic Organics, Growing Home, or the Chicago Honey Co-op) to speak at your school. Host a fundraiser by having a chef cook a meal using some of the herbs from the classroom garden.

**MILESTONE #20: Complete online report for Phase IV, due Friday, May 27.**

## **CLUB ACTION PROJECT WORKSHOPS\*:**

*\*Attendance is mandatory for at least one teacher representative per school. Dinner will be provided. Workshop Location: Chicago Center for Green Technology, 445 North Sacramento Blvd.*

- October 12, 4:30 – 7:30 p.m.
- December 7, 4:30 – 7:30 p.m.
- March 8, 4:30-7:30 p.m.
- May 3, 4:30 – 7:30 p.m.

## **ADDITIONAL RESOURCES:**

### **C3 First Year Project Guides Related to this Project:**

- Waste Audit Guide
- Worms Ate My Lunch Project Guide
- Reduce Reuse Recycle Rethink Project Guide

### **Online Resources:**

- Chartwells, [www.eatlearnlive.com](http://www.eatlearnlive.com)
- “Discovering the Food System” curriculum, [www.hort.cornell.edu/departments/faculty/eames/foodsyst/index.html](http://www.hort.cornell.edu/departments/faculty/eames/foodsyst/index.html)
- “Do You Know Where Your Mushrooms Come From?” NPR transcript, [www.npr.org/templates/story/story.php?storyId=91587384](http://www.npr.org/templates/story/story.php?storyId=91587384)
- Farm to School, [www.farmtoschool.org](http://www.farmtoschool.org)
- “Food, Fuel, and Freeways” report by Iowa State University researchers, [www.leopold.iastate.edu/pubs/staff/ppp/](http://www.leopold.iastate.edu/pubs/staff/ppp/)
- Slow Food USA, [www.slowfoodusa.org](http://www.slowfoodusa.org)
- Waters Elementary School C3 Club videos showing their lunchroom waste reduction campaign <http://www.youtube.com/user/WatersMedia> (click on “What A Waste”)

### **Local Resources:**

- Angelic Organics
- Chicago Botanic Garden (and its School Garden Wizard website, [www.schoolgardenwizard.org](http://www.schoolgardenwizard.org))
- Chicago Honey Co-op
- City Farm
- Green City Market
- Greencorps Chicago
- Growing Home

# **PROJECT APPENDIX**

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## CLIMATE CHANGE AND YOUR SCHOOL CAFETERIA

### What does the school cafeteria have to do with human-caused climate change?

The food system - all of the processes related to supplying food to the people who eat it - has many steps. Food must be grown, harvested or fished, and in most cases, processed, packaged, transported, marketed, and stored before it gets to your plate. After food is consumed, food and packaging waste are part of the food system, too. The energy used and the waste produced along the way can affect the environment.

### Did you know?

- Farmers are less than 1% of the United States population.
- The average produce item traveled 1,500 miles from the farm where it was grown to the area where it was purchased by a consumer.
- In 2005, Americans ate 200 pounds of meat per person, and 32 teaspoons of sweeteners per day.
- Agricultural activities are responsible for about 7% of the United States' greenhouse gas emissions.
- Of all the food that makes its way to consumers in the United States, 26% of it is never eaten.
- Of energy consumed along the entire food life cycle, the largest energy use - about 32% - comes from household food storage and preparation – e.g. refrigeration and cooking
- Runoff of fertilizers into the Mississippi River *contributes* to a “dead zone” in the Gulf of Mexico. This is an area about the size of the state of Connecticut where oxygen levels are so low, they cannot support aquatic life.

### For more information

The facts above are from the University of Michigan's fact sheet “U.S. Food System.” For more information about the food system life cycle, see the fact sheet at [http://css.snre.umich.edu/css\\_doc/CSS01-06.pdf](http://css.snre.umich.edu/css_doc/CSS01-06.pdf).

To learn more about the dead zone, visit the Science Museum of Minnesota's dead zone website: [www.smm.org/deadzone/](http://www.smm.org/deadzone/)

Green Teacher magazine (Fall 2005, issue 77) contains several suggestions for activities and demonstrations about the food system.

## Waste Audit Sample Memo

*[Teachers: This is a template of a memo for you to revise and send to your principal, building engineer, custodial staff, other teachers, and/or other administration members. You will need to delete or revise the text in brackets, fill in the blanks, or choose the appropriate text underneath the brackets. This memo is just suggested language - feel free to use/revise as you please.]*

TO: Principal \_\_\_\_\_ and Building Engineer

FROM: Chicago Conservation Corps (C3) Student Club or [teacher] and [students]

DATE: \_\_\_\_\_

RE: Waste Audit

---

We want to make you aware of the Waste Audit that our after-school Chicago Conservation Corps (C3) Student Club will be carrying out this month, and ask for your cooperation and feedback. As you remember from the Principal's Pledge that you signed, this Club is sponsored by the Chicago Department of Environment.

### **[Comprehensive Audit (Option 1)]**

The purpose of this activity is to determine approximately how much waste the school produces on a daily basis and to have students and school staff start thinking about alternatives to waste production. We will choose a few times and areas as a representative sample of the school, focused mostly in the lunchroom, in accordance with our current project, "Lunch and Learn."

On [DATE], we will post signs at each location asking teachers, students, administration and staff to sort their garbage into "wet" trash, "dry" trash, and recyclables if they do so normally.

We ask that the trash from this day not be picked up in the marked locations. At the end of the next day [DATE], we will collect the bags and bring them to the parking lot for sorting and weighing. We will record the weight of the wet and dry waste and record what dry waste could have been recycled. We will lay a tarp to prevent any leaking onto the parking lot. Only students with signed permission slips will handle the trash, and they will wear gloves at all times. After weighing and sorting, we will dispose of the trash in the \_\_\_\_\_ dumpster located \_\_\_\_\_, and the recyclables in the \_\_\_\_\_ dumpster located \_\_\_\_\_.

### **[Walkthrough Audit (Option 2)]**

The purpose of this activity is to determine approximately how much waste the school produces on a daily basis and to think about the repercussions of trash production. We will choose 5-10 areas as a representative sample of the school – potentially including classrooms, offices, hallways, and the lunch room.

On [DATE], we will post signs at each location to notify the custodians which trash receptacles we will be examining. **Custodial staff:** Please wait to pick up the trash in the marked receptacles (between 5-10 total) until [time when survey will be over] on [date when survey will take place]. Let us know if it would be helpful if the Club members can help collect the trash from the designated areas.

At the end of the school day on [DATE when survey will take place], students will survey the trash in the designated receptacles to estimate the quantity of trash and recyclables, and to determine what items in the trash could have been recycled, composted, or re-used. All students will be wearing gloves and use tools to handle the garbage.

**[For both]**

The guide we will be using for the waste survey is attached for your reference. Please let us know if you have any questions or concerns. If you would like, we could put you in touch with a staff person at the Chicago Conservation Corps (C3).

Thanks in advance for your support of our C3 Student Club efforts!

Queremos avisarle de la inspección de los desechos que está haciendo el nuevo programa Chicago Conservation Club este otoño. Pedimos su cooperación.

**[Audit Method 1]**

Esta actividad debe determinar la cantidad de basura que produce la escuela. El propósito es que los alumnos y el personal piensen sobre las alternativas a la producción de basura. Escogemos 5 a 10 ubicaciones en la escuela – potencialmente las aulas, las oficinas, los pasillos, y el comedor.

El (insert date) de octubre, habrá un signo cerca de cada ubicación en que pregunta los profesores, los alumnos, y el personal para clasificar su basura – la basura mojada, la basura seca, y el reciclaje.

Por favor, en este día no lleve la basura en las ubicaciones marcadas. Al fin del próximo día, colectamos las bolsas y las traemos al estacionamiento para clasificarlas y pesarlas. Medimos el peso de la basura mojada y la basura seca, y luego, recordamos la basura seca que pudiera haber reciclada. Para evitar el escape de la basura, ponemos una lona por el estacionamiento. Sólo los alumnos con un papelito firmado de sus guardianes pueden tocar la basura. Todo el mundo se usará los guantes. Después de pesar y clasificar la basura, la disponemos en el contenedor que está ubicado \_\_\_\_\_, y el reciclaje en el contenedor que está ubicado \_\_\_\_\_.

**[Audit Method 2]**

Esta actividad debe determinar la cantidad de basura que la escuela produce diariamente. El propósito es que los alumnos y el personal piensen sobre las repercusiones de la producción de basura. Escogemos 5 a 10 ubicaciones en la escuela – potencialmente las aulas, las oficinas, los pasillos, y el comedor.

El (insert date) de octubre, habrá un signo cerca de cada ubicación que notifica a los custodios de cuales basureros los alumnos están usando para la inspección. Por favor, no lleve la basura en las ubicaciones marcadas hasta insert time el insert date de octubre. Contáctenos si le guste que los alumnos colectan la basura de las ubicaciones marcadas.

Al fin del (insert date) de octubre, los alumnos calculan la cantidad de basura y el reciclaje. De allí, ellos determinan cuales artículos pudieran haber reciclado o reutilizado. Todo el mundo se usará los guantes y las herramientas para tocar la basura.

**Conclusion**

Por favor, avísenos si tenga una pregunta o una preocupación.

¡Mil gracias por su apoyo de Chicago Conservation Club!

### Permission Slip

On (date) \_\_\_\_\_ our C3 Student Club will be participating in a study of waste generated by the school cafeteria, which will involve the handling of school garbage. Students will be provided with gloves, we will coach them in safety procedures, and every precaution will be taken to ensure your child's safety. A faculty member will be present. We need your permission for your child to participate in this activity. If this meets your approval, please sign the statement below.

If you have any questions please contact \_\_\_\_\_ at school.

My child, \_\_\_\_\_ has my permission to participate in the school waste audit to be conducted at school.

Parent signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Please return this permission slip by \_\_\_\_\_, 200\_\_ to \_\_\_\_\_.*

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### Permission Slip

On (date) \_\_\_\_\_ our Conservation Club will be participating in a study of waste generated by the school cafeteria, which will involve the handling of school garbage. Students will be provided with gloves, we will coach them in safety procedures, and every precaution will be taken to ensure your child's safety. A faculty member will be present. We need your permission for your child to participate in this activity. If this meets your approval, please sign the statement below.

If you have any questions please contact \_\_\_\_\_ at school.

My child, \_\_\_\_\_ has my permission to participate in the school waste audit to be conducted at school.

Parent signature: \_\_\_\_\_ Date: \_\_\_\_\_

*Please return this permission slip by \_\_\_\_\_, 200\_\_ to \_\_\_\_\_.*

## Waste Audit Worksheet 1: Amount of Waste from Each Audit Station

This worksheet helps students calculate how much waste of the three types (wet, dry, and recyclable) was collected at each station.

Audit Station (Name)	Weight of Material Collected in Wet Bin (lbs)	Weight of Material Collected in Dry Bin (lbs)	Weight of Material Collected in Recycling Bin (if applicable) (lbs)
Example: Lunch, 12:00	5	7	0
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
<b>TOTAL:</b> (sum of each column)	Total Wet Waste	Total Dry Waste	Total Recyclable

## Waste Audit Worksheet 2: Types of Materials Found in Recycling and Dry Waste Bins

This worksheet helps students calculate how much of each type of recyclable material was collected in total (all of the Audit Stations combined). It also helps students calculate how much of each type of material was thrown away (and NOT recycled).

Type of Material	Weight of Types of Materials from All <u>Dry Waste Bins</u> ( <i>not Recycled</i> ) (lbs.)	Weight of Types of Materials from All <u>Recycling Bins</u> (if applicable) (lbs.)
Paper (e.g., office, newspaper)		
Cardboard		
Plastic Bottles		
Glass Bottles and Jars		
Aluminum Cans		
Batteries		
Other:		
Other:		
Other:		
Other:		
Actual Trash (non-recyclables)		<i>Do not include this number in total.</i>
<b>TOTAL (in pounds)</b>		

## Waste Audit, Worksheet 3:

### Analyzing the Results

This worksheet helps students calculate an estimate of the total amount of trash and recyclables generated in their lunchroom **per year**.

To fill in the first column (T), refer to the bottom of **Worksheet 1**

*NOTE: If you audited more than one lunch hour, be sure to fill in column T with the average amount of total trash collected in ONE lunch hour. Example: 100 total lbs of trash collected over 2 lunch hrs, divided by 2 lunch hrs = 50 total pounds of trash per avg. lunch hr)*

Type of waste	Total amount of materials collected in one lunch hour (in lbs) (T)	Number of lunch room audit stations (N)	T / N = Average amount of waste per bin (R)	Appx. number of receptacle bins in the cafeteria (B)	R x B = Average amount of waste per lunch hour (L)	Number of lunch periods per day (P)	L x P = Average amount of lunchroom waste per day (D)	D x 175 days = Average amount of lunchroom waste per school year
Trash	Total weight/volume of all trash (wet + dry) =							
Recyclables	Total weight/volume of all recyclables =							

For comparison's sake, if you measured the **weight** of your waste, the average school bus weighs about 23,000 lbs – how many school buses would it take to equal the number of pounds of trash your school generated in a year? If you measured the **volume** of your waste, the average school bus has a volume of about 1700 ft<sup>3</sup>. How many school buses could you fill with your school's trash in a year? Do you think that's a lot of waste?

## Waste Audit, Worksheet 4: *Analyzing the Results*

What could be done to make the amount of waste your school generates per year *smaller*? Remembering what you saw in your audit (and referencing **Worksheet 2** and **Worksheet 3**), use the table below to make a list of ways your school could produce less waste.

<b>Method</b>	<b>What types of waste at your school could be eliminated by doing these things? List as many as you can!</b>
Compost	
Reduce	
Reuse	
Recycle	

## Alternative Lunchroom Waste Audit

**Overview:** If you or your school's administration prefer not to separate the wet and dry waste to be weighed and sorted in the parking lot, you can still conduct a walkthrough lunchroom waste audit. Students will visually estimate how much trash was generated from collection areas in the lunchroom and search for materials that could be recycled, not initially used, etc.

### Suggested Materials:

- Gloves for each student
- Alternative Lunchroom Waste Audit worksheet
- Pole, yardstick, or other object for sorting through trash

### Phase 1 Procedures

#### **MILESTONE #2: Organize the Club for the lunchroom waste audit. (2 meetings)**

- Send permission slips home if necessary.** If it is necessary to document permission from the Club members' parents or legal guardians for the lunchroom waste audit, copy the permission slip provided (p.23), and send these home with the Club members after the first Lunch & Learn meeting.
- Lead a discussion about the connection between global climate change and the school cafeteria.** Use the fact sheet and discussion guide (p.22), and if time allows choose from the list of activities provided to introduce the topic.
- Conduct a brief reconnaissance mission to the cafeteria.** Check the existing waste disposal and recycling capacity of the cafeteria. Does the cafeteria have bins to separate food waste from recyclables? Are there facilities for washing reusable trays, plates, and utensils? Does all trash go into the same bin? If cafeteria staff and/or custodians had previously expressed interest in the project, ask if they would be willing to lead the cafeteria tour and explain the "behind-the-scenes" food waste disposal processes to the Club.
- Decide on the details.** Keeping in mind what was learned from the tour of the cafeteria, decide on the details for the lunchroom waste audit. The following are some questions to consider. Where are receptacles placed in the cafeteria? Are there any other locations where students eat lunch that may also have receptacles? Is there any reason to monitor the waste by lunch period? by grade? Will it be sufficient to monitor trash from only one lunch period and extrapolate to all lunch periods?
- Announce the lunchroom waste audit to the school.** Make posters to place in the lunchroom and any other appropriate areas to announce the upcoming lunchroom waste audit. and to ask students and teachers to assist by sorting their waste (if possible) on the day of the audit.

- **Set up bins for collecting wet, dry, and recyclable materials during the lunchroom waste audit.** Set up at least two – and more if the volume of trash produced is greater – receptacles (use receptacles available in the cafeteria and add labels and trash liners as necessary), one for wet trash (food and liquids) and one for dry waste (packaging, paper, napkins, etc). If your school already has recycling bins in the cafeteria, then students should use them as usual on the day of the audit. If the school does not currently use recycling bins, then do not set up a separate bin for the purposes of the audit (recyclables can be placed in the dry waste receptacle). Make sure that the bins are in place and empty on the morning of the audit. Although the Club will not be weighing the trash, maintaining separate waste collection bins will make accurate estimates easier to do.
- **Make labels for each receptacle showing the kind of waste that should be placed in it.** Make signs for each receptacle location in the cafeteria to explain the audit and post the date of the audit. Include examples of the wet and dry waste on the signs to make sorting easier for students. Designate Club members to place labels on receptacles, and signs above receptacles, either at the end of the day before the audit or first thing in the morning on the day of the audit.

<b>Examples of dry waste</b>	<b>Examples of wet waste</b>
<ul style="list-style-type: none"> <li>• Candy wrappers (and any other kinds of wrappers)</li> <li>• Empty potato chip bags</li> <li>• Lunch bags</li> <li>• Bakery containers</li> <li>• Empty soda or water bottles</li> <li>• Any type of paper, plastic wrap, or packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Leftover lunch items such as: sandwiches, fruit, yogurt, cheese, chips, bread, soup, and milk</li> <li>• Paper trays with leftover food on them</li> <li>• Used paper towels, napkins, and tissues</li> </ul>

- **Ask for volunteers or appoint sorting captains for the day of the audit.** Club members will take responsibility for being stationed at the waste receptacles on the day of the audit to help students sort their lunch waste properly during the lunch period.
- **Discuss the procedure for measuring the waste in the bins.** Emphasize that students will not be touching trash, only estimating how much is there. Discuss how they can create an estimate and practice measuring one trash receptacle as a group (see the worksheets on p.31-32).

### **MILESTONE #3: Conduct a waste audit of the lunchroom. (1 meeting)**

- Conduct a final audit preparation check.** The morning before the audit, make sure that the receptacles are in place in the lunchroom, and that the signs and receptacle labels are on display. Remind teachers and students that they should separate their cafeteria trash that day at lunch.
- Get into gear for the audit.** Distribute gloves to each student.
- Hand out the Alternative Lunchroom Waste Audit worksheet and **review the audit procedure with students.** Discuss how students will estimate the amount of trash in each receptacle. In order to decide on a standard procedure, students may need to look at the trash cans and recycling bins in the lunchroom. For example, Club members can record the number of bags at each trash location and estimate how full they are (1/4 full, 1/2 full, etc.)
- Coach students on safety procedures.** You may want to set your own rules, but here are some suggestions:
  - Wear gloves at all times.
  - Use the yardsticks to move trash around.
  - Avoid touching wet waste or any otherwise unsanitary trash.
- Have students visit their stations to estimate the waste generated there (in cubic feet).** Record data on Worksheet A (see p.31). Club members will estimate how much trash each area of the lunchroom generates and look for items that could have been recycled, reused, reduced (i.e., not used in the first place), composted, donated, or exchanged.
- Complete the calculations** on worksheet A by calculating the volume of each bin (see Worksheet B, p. 32).

# Walk-through Waste Audit, Worksheet A:

## Collecting Information to Calculate Estimates of Volume of Waste at Each Audit Station

This worksheet helps students collect the necessary information at the Audit Stations. They should carry this with them when they do the Walk-through Audit and fill in all of the fields that they can. Note: They will have to determine whether each bin has a circular top or rectangular top before they decide which column to fill in.

They will use this information later to calculate the estimated volume of the materials they find in the bins.

Audit Station (Name)		FOR ALL BINS:	If bin has a circular top:	If bin has a rectangular top:	
		Height of <b>waste</b> from bottom of bin (in feet) <i>Note: measure the height of the <u>waste only</u>, not of the entire bin)</i> <b>(H)</b>	Diameter of top of bin (in feet) <i>Note: This is the distance from one side of the circle to the other at its widest point.</i> <b>(D)</b>	Width of top of bin (in feet) <b>(W)</b>	Length of top of bin (in feet) <b>(L)</b>
1.	Trash:				
	Recycling:				
2.	Trash:				
	Recycling:				
3.	Trash:				
	Recycling:				
4.	Trash:				
	Recycling:				
5.	Trash:				
	Recycling:				
6.	Trash:				
	Recycling:				
7.	Trash:				
	Recycling:				
8.	Trash:				
	Recycling:				
9.	Trash:				
	Recycling:				
10.	Trash:				
	Recycling:				

## Walk-through Waste Audit, Worksheet B: Estimates of Volume of Garbage at Each Audit Station

This worksheet helps students calculate the estimated volume of the materials they find in the trash and recycling bins. The data for these calculations can be found on **Worksheet 3**. Students should use the following equations to make their estimates:

For circular trash cans:

1. Divide the diameter (**D**) by two to get the *radius*. This is the distance from the center of the circle to the edge of the circle.
2. Multiply the radius by itself (for example, 1.3 ft x 1.3 ft), then multiply that number by 3.14 (*pi*).

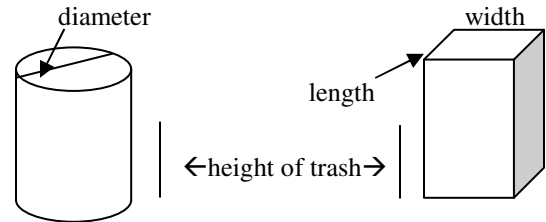
$$\left(\frac{D}{2}\right)^2 \times 3.14 = A$$

This will give you the area of the top of the bin (**A** below). Enter this value into the appropriate column, based on whether it is a bin for trash or recyclables.

3. Enter the height (**H**) from **Worksheet 3** into the table below.
4. Multiply **A** (the area) by **H** (the height). The result is the estimated volume (**V** below) of your recyclables or trash.

For rectangular trash cans:

1. Multiply the length (**L**) by the width (**W**) from **Worksheet 3**. This will give you the area of the top of the bin (**A** below). Enter this value into the appropriate column, based on whether it is a bin for trash or recyclables.
2. Enter the height (**H**) from **Worksheet 3** into the table below.
3. Multiply **A** (the area) by **H** (the height). The result is the estimated volume (**V** below) of your recyclables or trash.



Audit Station (Name)	TRASH BINS: Estimated Volume (A x H = V) of Materials (in cubic feet)			RECYCLING BINS: Estimated Volume (A x H = V) of Materials (in cubic feet)		
	Area (A) of top of bin	Height (H) of trash	Volume (V) in cubic feet	Area (A) of top of bin	Height (H) of recyclables	Volume (V) in cubic feet
Ex: Lunch, 12pm	2 ft <sup>2</sup>	x 3 ft	= 6 ft <sup>3</sup>			
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
Total Volume	Volume of all trash:			Volume of all recyclables:		

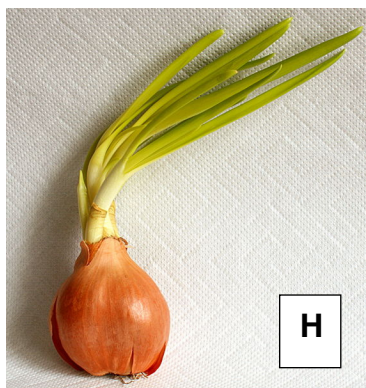
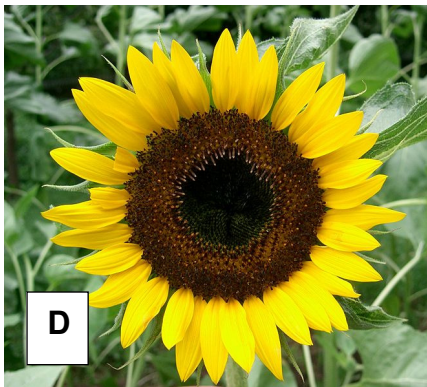


# Food Matching Game

Match the Flamin' Hot ingredient to its original plant, animal, or other source.

1. enriched corn meal \_\_\_\_\_
2. vegetable oil \_\_\_\_\_
3. maltodextrin \_\_\_\_\_
4. monosodium glutamate \_\_\_\_\_
5. artificial color \_\_\_\_\_
6. hydrolyzed soy protein \_\_\_\_\_

7. whey protein concentrate \_\_\_\_\_
8. sodium caseinate \_\_\_\_\_
9. lactic acid \_\_\_\_\_
10. onion powder \_\_\_\_\_
11. disodium guanylate \_\_\_\_\_
12. carrageenan \_\_\_\_\_



Answers: 1 G (corn), 2 D (sunflower), 3 G (corn), 4 C (sugarcane), 5 B (coal tar), 6 F (soybean), 7 E (cow), 8 E (cow), 9 G (corn), 10 H (onion), 11 A (fish), 12 I (seaweed)

## Geographic origins of food

According to a study by researchers from Iowa State University, these are the most likely sources of the following foods arriving in Chicago.

Choose a cafeteria meal, and find one of the items in that meal on the list below. Using a map, measure the distance from Chicago to the center of each state of origin for the food items you choose.

Item	State of origin	Item	State of origin
apples	Washington	onions	California
bell peppers	California	melons	Missouri
blueberries	California	tomatoes	California
broccoli	California	strawberries	California
cabbage	Georgia	spinach	California
carrots	California	beans	Georgia
cauliflower	California	lettuce	California
cucumbers	California	potatoes	Idaho
grapes	Georgia	plums	California
mushrooms	Pennsylvania	pears	Washington

How far did your food travel (in kilometers)? \_\_\_\_\_  
(Note: 1 km = 0.62 miles)

Now, multiply the distance in kilometers by 41 for each food item. If your food traveled by rail, this is the total grams of CO<sub>2</sub> emissions per 1000 kilograms of that food item (we use tons since no one would ship a single apple or tomato across the country). \_\_\_\_\_

Multiply the distance in kilometers by 207 for each food item. If your food traveled by road, this is the total grams of CO<sub>2</sub> emissions per 1000 kilograms of that food item. \_\_\_\_\_

*For comparison, 1000 kilograms of apples = about 6,500 apples.*

If a food item from your cafeteria meal wasn't on the list, you can try looking for an item in the grocery store. Produce should have a label with the state - or the country - where it was grown.

In fact, some of the food we eat has specific climate requirements and therefore cannot be grown in the continental United States (pineapples, for example). Try to find out where your favorite food can be grown.