Santa Cruz COUNTY OFFICE OF EDUCATION

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LIFE LAB Science Program

Public Schools Resource Conservation Program

Away with School Waste

A Teacher's Guide to Starting a School Waste Reduction, Recycling & Composting Program

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Introduction

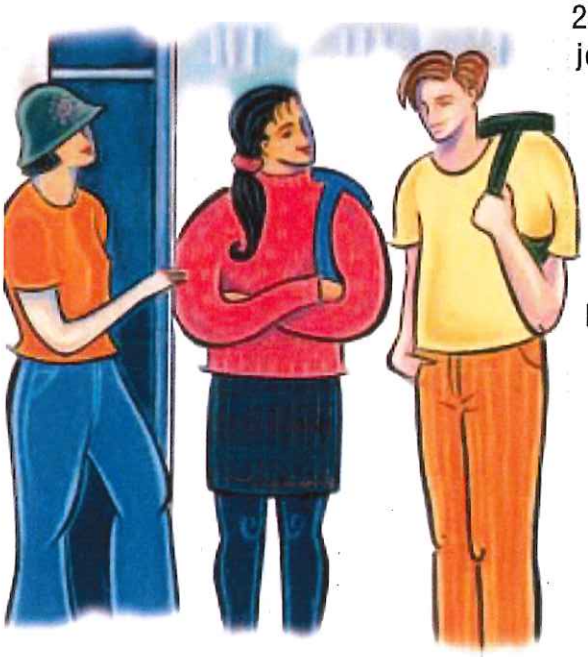
Every day, Santa Cruz County residents dispose of 1,092,857 pounds of garbage. That means that each one of us produces an average of 2.4 pounds of household garbage per day. Of that garbage, over 65% could easily be recycled. As landfill space becomes scarce, it becomes more critical that we reduce the amount of waste we produce. Our schools should be models of waste reduction as well as centers of community education. Students who practice waste reduction and conservation at school are more likely to behave responsibly at home.

Away with School Waste was developed to help schools in Santa Cruz County set up a schoolwide waste management program. It grew out of the Public Schools Resource Conservation Program (PSRCP) for Santa Cruz County schools that began in September 1997. The purpose of the PSRCP is to engage students in a community-based ecology and waste management program that will enhance student understanding of solid waste reduction, recycling, and composting. The program's goals are to integrate learning in science, language arts, math, and social studies; to enhance understanding of basic conservation principles and recycling; to instill a sense of individual responsibility for waste reduction; and to develop skills in project-oriented group work.

This guide provides all the information you need to get started at your own school site, including how to

- work with students, school staff, and administrators;
- educate parents;
- tie the program to the classroom curriculum and state standards;
- analyze your trash;
- have fun with worms;
- save money;
- sustain the program at your school site.

Away with School Waste was written for you, the teacher. It is based on the experiences of teachers in the PSRCP at 25 different schools in Santa Cruz County. The PSRCP is a joint project of the Santa Cruz County Office of Education, Ecology Action, and Life Lab Science Program. Schools involved in the PSRCP divert waste from local landfills by means of paper, container, and food waste recycling. In doing so, they teach conservation while saving money on waste-hauling charges. For more information on how your school can become involved, please contact **Ecology Action at 831.426.5925.**



Away with School Waste

A Teacher's Guide to Starting a School Waste Reduction, Recycling and Composting Program

We especially thank the following funders:

County of Santa Cruz

City of Santa Cruz

City of Capitola

City of Scotts Valley

Waste Management of Santa Cruz County

This guide would not have been possible without firsthand information from these Public Schools Resource Conservation Program Schools:

Live Oak School District
Green Acres Elementary School
Live Oak Elementary School

Pacific School District
Pacific School

Pajaro Valley Unified School District
Alianza Elementary School
Aptos High School
Lakeview Middle School
Mar Vista Elementary School
MacQuiddy Elementary School
Valencia Elementary School

San Lorenzo Valley Unified School District
Boulder Creek Elementary School
Quail Hollow Elementary School
Redwood Elementary School
SLV Elementary School
SLV High School

Santa Cruz City Schools
Branciforte Elementary School
DeLaveaga Elementary School
Gault Elementary School
Natural Bridges Elementary School
Soquel High School
Westlake Elementary School

Scotts Valley Unified School District
Brook Knoll Elementary School
Scotts Valley High School

Soquel Union Elementary School District
Capitola Elementary School
Main Street Elementary School
New Brighton Middle School

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It Takes a Team 1

Tips for a Successful Program

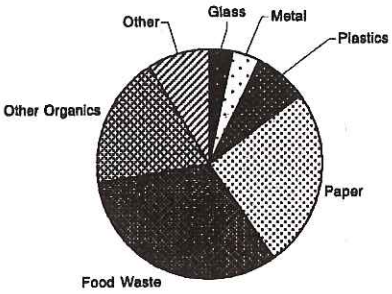
As you embark on this program, here are a few tips to keep in mind:

- ✔ To make this program sustainable, use a team approach. One person cannot manage and maintain the whole program alone.
- ✔ Start small and gradually "grow" your program. Set clear goals at each stage to keep the program on track.
- ✔ Create buy-in by involving people from all parts of the school community, including administration, custodial personnel, students, and parents.
- ✔ Maintain a clear and positive message to the school community. Advertise and celebrate your successes.
- ✔ Know that your efforts are important and that you are making a difference!

It takes more than one person to develop and maintain a school recycling program—it takes a team. With a team, you can share the responsibilities of the program. Look for team members who have an interest in recycling and who support natural resource conservation. A recycling team can help with planning and provide the human power needed to make the program work. Draw team members from the faculty, administration, custodial staff, and student body (for example, the student council, one class or grade level, or an athletic team, or any combination of these). It is important to have a representative from the school's custodial staff from the outset. This team member is critical to the program's success.

2 Talking Trash

Get to know your trash!



1998 Unincorporated Santa Cruz County Residential Waste Survey results.

Once you have your team, it's time to talk trash. Get to know what kinds of trash different parts of the school produce, how trash currently is collected and managed, and what recycling, if any, is already taking place. One way to find out is to conduct a waste audit interview. There are two main steps in conducting a waste audit interview:

1. Talk to those in the know.

Interview the head custodian and other members of the school staff who have experience dealing with your school's trash and recyclables. Use the **"Waste Audit Interview Questions"** to guide you through the interview process.

2. Take a hike.

Walk around campus at various times over the course of a week or so. Peek into trash cans, dumpsters, and recycling bins. Get to know firsthand where trash and recyclables are generated, what kinds of trash and recyclables are produced in different parts of the school campus, and where the trash and recyclables end up.

Waste Audit Interview Questions

Garbage Questions

1. Does a company pick up the school waste?

   If so, what is the company's name?

2. How many garbage carts and/or dumpsters does our school have?

3. What sizes are these containers?

4. How often are these containers picked up?

5. On average, how full are the garbage carts and/or dumpsters on pick-up day?

6. Are there seasonal differences in the amount of waste generated?

7. Does the school share the garbage carts and/or dumpsters with other school facilities or businesses?

   If yes, what is the name of the facility or business?

   What percentage of the waste stream does this other facility contribute?

8. How much is the school's monthly hauling bill?

9. Imagine that all of the waste generated on campus in one year is in a large pile. Find out how different kinds of materials contribute to the total volume of garbage that is thrown away. Read through the list of material types. Estimate the percentage of the total volume made up of these materials.
   a. Cardboard
   b. Mixed paper (office paper, writing paper, phone books, magazines, junk mail, catalogs, paperboard, paper bags)
   c. Plastic bottles, trays, and tubs (#1–#17)
   d. Aluminum cans, foil, and trays
   e. Glass bottles and jars
   f. Tin cans
   g. Milk cartons, aseptic packaging (such as juice boxes)
   h. Food waste
   i. Food packaging
   j. Paper towels, napkins
   k. Trash liners, film plastic
   l. Styrofoam peanuts and blocks
   m. Computer/electronic equipment
   n. Scrap metal
   o. Wood
   p. Yard waste
   q. Trash from outsiders
   r. Other (please list types)

Recycling Questions

1. What materials does the school recycle?
2. How are these materials separated and collected?
3. Are these recycling systems working well?
4. Does a company pick up the recyclables or are they taken to the recycling center in another way?
5. Does the school have recycling cards and/or dumpsters? If yes, how many and what sizes are they?
6. How often are these recycling containers picked up?
7. On average, how full are these containers on pick-up day?
8. Does the school need additional recycling carts and/or dumpsters?

3 Getting Started

Once you have gathered information about your school's trash, it's time to put together a program for your school that will run effectively.

Recycling

First, decide what materials to recycle, how to collect and separate them, and how to gain the enthusiastic participation and support of your students and school staff.

To begin, think in terms of categories of recyclables. The most common categories of recyclables at schools are

- cardboard,
- mixed paper products, and
- mixed containers such as aluminum and tin cans, plastic containers, and glass bottles and jars.

Next, get an up-to-date list of the kinds of materials that can be recycled in your area. Call your waste hauler to find out. Turn to the inside cover for contact information. If your school does not have a waste hauler, locate the nearest recycling center and ask for information on the kinds of materials the center accepts.

For each category of recyclables, answer the following questions:.

Where is the waste material generated on campus?

Different types of waste materials are likely to predominate in different parts of the school. For example, we've found that most cardboard waste is generated in the kitchen and the storage warehouse, while most paper waste tends to be generated in the classrooms and offices throughout campus.

How can the material be collected for recycling?

We've found that it's best to put a well-labeled recycling bin every where recyclables are generated. For example, put paper-recycling bins in every classroom; in the library; next to each office desk, copier, printer, and fax machine; and by the teachers' mailboxes. We've also found that it's helpful to place a mixed-container recycling bin in the teachers' break room, in several of the classrooms, and in the cafeteria. Figure out how to get the bins—from the waste-hauling agency or the custodial department—and how you want to label them. Consistency is important.

In general, cardboard can't be put in small recycling bins because of size constraints. We suggest asking people to break it down and stack it in specific locations for pickup and transfer to the recycling dumpster or central storage location.

The most common school recyclables:

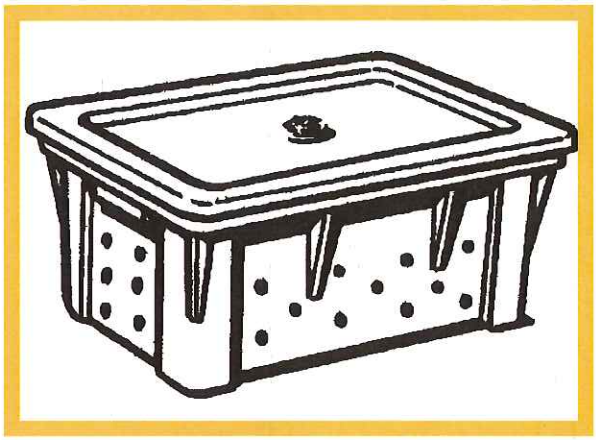
- ✔ cardboard
- ✔ mixed paper products
- ✔ mixed containers such as aluminum and tin cans, plastic containers, glass bottles and jars.

Vermicomposting

You need only a few things to make good worm compost.

1. Worm bin:

You can use a plastic storage bin, shipping crate, commercial worm bin, or homemade wooden bin. Bins should be 8"–14" inches deep. Be sure to have a tight-fitting lid. Drill 1/4" holes in diameter in the bottom and sides, 5"–7" apart, to provide ventilation and drainage. Ultraviolet light is toxic to worms—make certain that bins are made from an opaque material!



The rule of thumb for bin size is 2 square feet of surface area per person, or 1 square foot of surface area per pound of food waste generated each week.

2. Bedding materials:

The compost worm's natural habitat is a pile of fallen leaves or manure. You will need at least 4" of bedding materials to keep the worms cool and moist, to give them fiber to eat, and to discourage fruit flies from getting into the food. For best results, you can make bedding from any one of the following list of materials, or a mixture of any of these materials, including brown leaves, straw, sawdust, shredded corrugated cardboard, finished compost, and shredded black-and-white paper **(no magazines or other glossy paper).**

3. Water:

Sprinkle water on the bedding material until it is evenly damp. Make sure it is always as moist as a wrung-out sponge. After you water the bedding, fluff it to create room for worms to crawl, and toss in a few handfuls of soil.

4. Worms:

Compost worms are called "red worms" or "red wigglers." They are often found in old compost piles, and are different from the earthworms you usually find in the ground. Their scientific names are *Eisenia foetida* and *Lumbricus rubellus*. They have a big appetite, reproduce quickly, and thrive in confinement. They can eat more than half their own weight in food every day! One pound of red worms is all you need to get started. Call Ecology Action's Rotline (831) 423-HEAP (4327) to find out where you can purchase them.

Setting Up Your Composting Program

Why compost?

Each day, organic waste is thrown away in schools. One of the objectives of the Public Schools Resource Conservation Program is to divert waste away from landfills. By composting, you not only reduce what goes into the waste stream, but you also reuse the valuable end product—a rich soil amendment. You can use the soil amendment to put important nutrients back into the soil. Use it in your school garden and on the school grounds.

Composting is a great way for your students to learn about life cycles, the nutrient cycle, ecosystems and habitats, and worm anatomy. They can also practice their math and language arts skills as part of the composting project. See **page 13** for more curriculum ideas.

How to compost

There are two types of composting: regular composting and vermicomposting (composting with worms). Regular composting is great for recycling both yard and food waste, whereas vermicomposting is great for recycling only food waste. Each type of composting offers a wealth of educational opportunities. You may decide to use both methods in your school composting program because of the varied learning opportunities that each offers.

Decide which kind of composting you will do and what you will compost. Consult the list of compost "do's and don'ts " on **page 9.**

Regular Composting

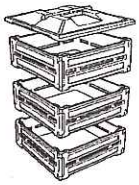
The "Big 5" recipe for a healthy compost pile:

1. **Browns**
2. **Greens**
3. **Water**
4. **Air**
5. **Soil**

A healthy compost pile contains the "big 5."

1. **Browns** are carbon-rich, dry woody materials such as fallen leaves, straw, sawdust, and dried plants.
2. **Greens** are nitrogen-rich, moist materials such as kitchen or cafeteria scraps, young weeds, and grass clippings. Your "green" sources will serve as the activator in your pile.
3. **Water** your pile until it is moist but not wet, or until it's the consistency of a wrung-out sponge. Water your pile when you water your garden.
4. **Air** incorporated into your pile will significantly speed up its decomposition. You can add air by turning the pile, or by layering it with bulky materials in order to create air spaces between materials.
5. **Soil** sprinkled throughout the pile as you layer it will provide microorganisms to help in the decomposition process.

There are many styles of composting containers available for sale commercially.



There are many ways to set up a compost pile. One way is to build an enclosure for the pile by wiring together 4 used wooden palettes. Be sure to wire only one side of the front palette, so you can open it like a gate. Or you can make a simple enclosure out of chicken wire or hog wire formed in the shape of an upright cylinder. Another way is simply to form a cube-shaped pile using the layers of material, building a freestanding pile. To make your compost pile "cook" as it decomposes, make sure that the finished pile is at least 4' x 4' x 4'.

Building the Pile

Location, location, location! Build the pile close to the school garden for easy watering and transport of finished compost.

As you collect materials, form your compost pile out of layers that measure 4"–6" thick. Begin with a layer of "browns," followed by a layer of "greens" and a sprinkling of soil. Water well after every 3 layers. If you have enough browns and greens on hand, you can make a compost pile all at once. Otherwise, you can begin a pile with whatever you have and add to it whenever you have new material. If you are adding cafeteria scraps on a daily basis, be sure that you always cover them with a layer of browns and a sprinkling of soil.

To Turn or Not to Turn?

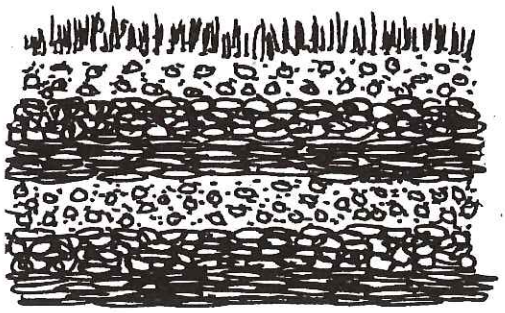
There are two basic methods for making compost, the fast method and the slow method. The fast method produces compost in 4–8 weeks. You build the pile and turn it every few days, so that the outside of the old pile becomes the inside of the new pile. Please note: **This takes time and hard work!**

If you choose the slow method, which takes 4–8 months to create a useable product, simply leave the layered pile to decompose.

When Is the Compost Ready?

Depending on the method you use, after a few weeks or months dig into the side of your pile near the bottom. Inside, you should find dark crumbly material that looks like soil. This finished compost can be mixed directly into the top few inches of your garden beds or around individual plants. Remember that no matter what method you use, eventually the pile will decompose.

Components of a compost pile



Did you know that almost 25% of the waste that ends up in a landfill is organic material that could have been composted?

Where will I put the recyclables once the recycling bins are full?

If you will be taking recyclables to the recycling center on your own, designate a central location for the materials to be stored before being transported. If your school has a waste hauler, that company will provide you with a recycling dumpster for cardboard, and rolling carts for paper and containers. Call the numbers listed on the inside back cover for more information. Make sure you have a cardboard dumpster and enough carts to start your recycling project. Monitor how full the dumpster and carts are when they are picked up every week. If you see that they are beginning to overflow, order more carts or a larger cardboard dumpster. Monitor the garbage dumpster, as well. If you find that it never fills up, reduce your garbage-hauling service. This will save your district money.

How will I transfer the recyclables from the recycling bins to the recycling carts or central storage location?

We recommend using student power—assign a group of students to the task. To avoid burnout, spread the work around. Have several classes sign up for recycling duty, rotating them on a monthly basis. Make sure that the pickup times and days are consistent. For example, have the environmental club empty every paper and mixed-container recycling bin on Fridays at 2 p.m. Having a regular schedule is important in creating a system that is efficient and reliable. Since cardboard is bulky, we suggest asking the custodial staff to help out by transferring it to the appropriate location when they do their nighttime rounds.

How can I let the entire school know how to use the new recycling system and get them excited about participating?

We've found that individual classroom presentations are highly successful. Train students from the upper grades to give presentations to younger students. You also can train students to be lunchtime recycling monitors. Have them help educate other students during lunch by monitoring what is thrown into the recycling bins. You'll find other information on getting the word out on **page 11.** Be patient— it may take several years before the program becomes institutionalized. Be sure to acknowledge every little success along the way.

Composting

There are many wonderful books and Web sites about composting. Look in the "Resources" section on **page 16** for a list of our favorites. We encourage you to use one or more of these as you set up and maintain your composting program.

Below is a brief summary of the composting basics.

What is composting?

Composting is a method of recycling organic materials such as food scraps and plant trimmings. Over time, decomposers turn the organic material into a valuable, nutrient-rich soil amendment.

Compost Do's & Don'ts

Do Compost:

Fallen leaves
Finely chopped woody prunings
Pine needles
Untreated wood sawdust
Lawn clippings
Young weeds
Vegetable and fruit peels and scraps
Coffee grounds
Tea bags
Eggshells
Grasses
Manures from non meat-eating animals
Pasta, rice, chips and bread

Don't Compost:

Meat and bones
Fish
Dairy products
Greasy foods
Plywood sawdust
Treated-wood sawdust
Diseased plants
Droppings from meat-eating animals
Poison oak
Bermuda grass, ivy, or other spreading weeds
Barbecue or coal ashes

Organizing the Cafeteria for Compost Collection

Get food-waste collection containers. Five-gallon plastic buckets work well. You can usually get them free from local delis and bakeries. If you do not plan to empty the buckets daily, **GET LIDS!** Put your collection containers near the other recycling and trash containers. This makes it easier for students to sort their leftovers into the appropriate bin. If traffic jams occur around your compost and recycling center, set up a second site.

- Make a "Do Compost" list and attach it to the food-waste collection container.
- You may want to assign a group of students to be responsible for emptying food waste into the compost bin. This can be one class or a rotation of classes. To keep odors and the "yuck" factor down, include rinsing the bucket as part of the task. Give students plenty of reminders when it's their turn.
- We've found that students are most successful when they have frequent reminders. Each day, create a "Do Compost" sign and hang it near your food-waste collection site. Let students make the signs or write the day's compost list. This is a great way to encourage them to "own" the program.
- Educate students about what foods to compost.

We've found that having older students give classroom presentations to younger students is particularly effective.

Reducing and Reusing

Reduce the overall amount of materials you use on campus, and reuse materials as often as possible. This strategy is just as important to conserving natural resources as recycling and composting are. The following list suggests ways you can reduce and reuse at school. Work with the principal to incorporate some of these into your school policy. You may also want to pass the list around and encourage staff to participate on their own.

- Copy and print on both sides of the page whenever possible. With staff, discuss the feasibility of changing the default settings on copiers and printers to double sided.
- Make only the number of copies that you know you are going to need. Store one master copy for future use.
- As often as possible, reuse paper that has been printed on only one side. Designate space near copiers and printers, on desktops, and in other appropriate places to store it for use as note paper, scratch paper, printer and copier paper, and so on.
- Save envelopes for reuse. When reusing an envelope, be sure to cross out or cover the preprinted address and bar code.
- Reduce the amount of junk mail your school receives. Visit the following Web site for details: **http://dnr.metrokc.gov/swd/nwpc/bizjunkmail3.htm**
- Subscribe only to newspapers that are actually read on campus. Cancel all others. Share subscriptions whenever possible.
- Circulate, post, or e-mail memos and announcements instead of making individual copies for everyone
- Cover bulletin boards with fabric rather than butcher paper.
- If your school uses paperboard trays in the lunchroom, consider not using trays at all for upper-grade students who are able to carry everything without one. For lower-grade students, consider buying reusable plastic trays.
- Start a zero-waste lunch campaign to encourage and motivate staff and students to bring lunches from home in reusable pails and containers instead of disposable paper and plastic bags.
- Share resources such as books, posters, maps, and curriculum materials with coworkers instead of buying or producing copies of your own.
- Use dry-erase boards and chalkboards instead of paper whenever possible.
- Set up an exchange table in the lunchroom where students can put their unwanted food to share.
- Edit work on the computer before printing it.
- Use half sheets of paper for short quizzes, memos, and notices.
- Single-space documents and change margins whenever possible to avoid having pages with only a little text.

Getting the Word Out 4

Outreach and Education

As you set up your program, it is important to keep the entire school community informed of your plans. Everyone has a role to play in schoolwide waste reduction—from the classroom aides making copies to parents packing lunches. Here are some ideas on ways to get the word out.

Meetings

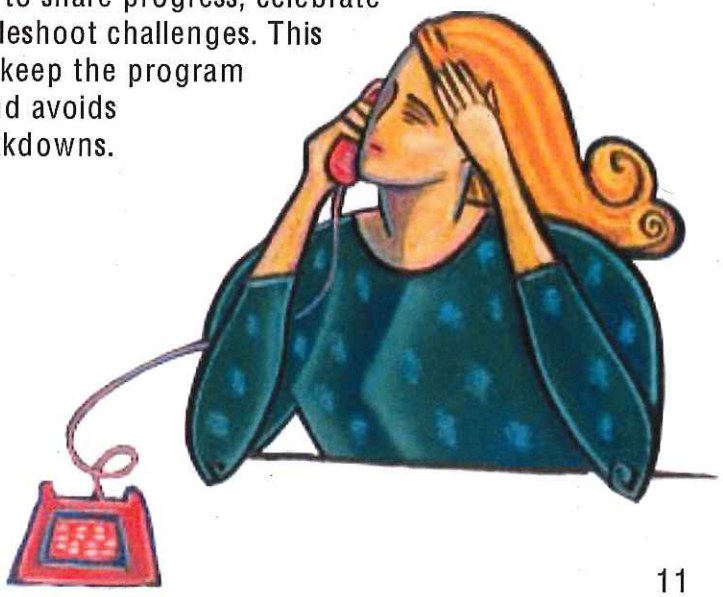
Have the resource conservation team send a representative to address a regular meeting of each of the following school groups: classified staff, custodial staff, teaching staff, home and school club (PTA), and student groups such as the student council.

Have the representative begin by giving a brief overview of why the school is taking on this project. Be sure to have the representative:

- Share the program's goals,
- Share the results of the Waste Audit Interview, and
- Elicit ideas from each group about ways in which individuals can help out.

Incorporate these ideas into the school waste reduction plan. For example, teachers might request special containers for the staff room for recycled paper or coffee grounds. Parents might need a blurb about the program to put in the PTA newsletter. Bring all suggestions and requests back to the school recycling team to be passed on to the appropriate person.

After the initial meetings with the various school groups, keep everyone informed through regular updates and check-ins. Have the recycling team representative attend meetings of the different groups throughout the year to share progress, celebrate successes, and troubleshoot challenges. This feedback loop helps keep the program running smoothly and avoids communication breakdowns.



Newsletter

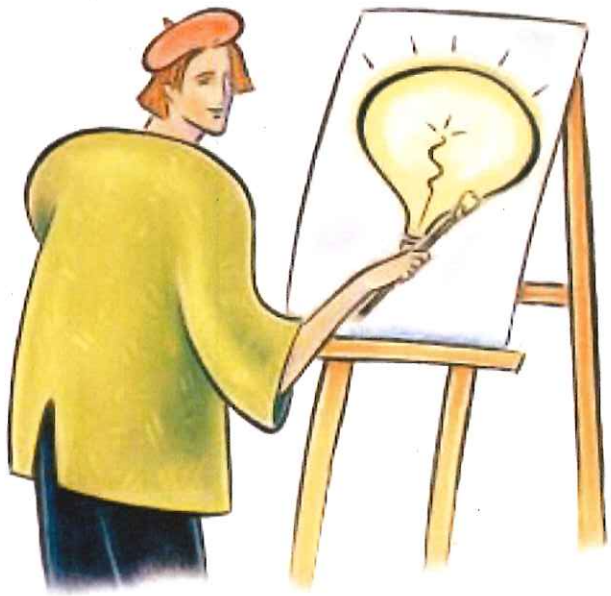
The school newsletter or weekly bulletin is a great way to communicate with the larger school community. We've found that a brief message from the principal about the goals of the program and ways in which everyone can contribute goes a long way toward getting the word out. Write a newsletter blurb whenever there is something new to report or simply as a regular reminder of the school's efforts. You can adapt the sample newsletter article below or write your own.

Sample newsletter article:

_____ School recently formed a resource conservation team that is working to reduce solid waste schoolwide through reusing, recycling, and composting. By participating in this program our students will learn environmental stewardship and good citizenship. Reducing waste also saves the school money through lower waste-hauling fees. We can all participate by choosing products with little or no packaging, packing school lunches in recyclable containers, and reusing and recycling instead of throwing things in the trash. To find out how you can help, please contact (coordinator) at (phone number).

Posters and Signs

Help get your program off the ground by using visual reminders. Children's artwork and messages are especially effective. Have a class or student group design posters for different areas of campus. Use the posters to remind the school community of their role in the program and specific things they can do to help. For example, have students make signs for the cafeteria to remind diners which food items can go in the compost pile. Have students decorate recycling bins to make them stand out. Create signs for the staff lounge asking teachers to recycle their lunch scraps and beverage containers. Some schools have held poster contests to choose appealing designs for the school's program. These designs can then be reproduced on posters, signs, aprons for lunch monitors, and even school T-shirts.



Schoolwide Events

PSRCP schools have used many different forums for getting the message out to the school community. One of the most successful has been the "captive audience" approach. Back-to-school nights, open house, sporting events, school carnivals, and assemblies are perfect opportunities to advertise the program. A member of the recycling team or the school principal can announce the purpose of the program and ask for participation. A staffed information table featuring a fun activity or students demonstrating vermicomposting can also catch people's attention. It's easy to piggyback on already scheduled events to keep the program alive and visible throughout the school year.

Some schools have chosen to schedule special events to highlight their commitment to environmental education and resource conservation. These events can take many forms, and they often take place in April during the week of Earth Day .

Several schools in the PSRCP have participated in "Low Waste Lunch Week," in which the whole school works toward minimizing lunchtime waste. Generally, the recycling team does a mini-audit of the lunchroom waste and tallies how many pounds (or trash cans full) of waste are thrown out after a typical lunch. Then, during the official Low Waste Lunch Week, students try to reduce that figure by bringing their lunches in reusable packages, composting scraps, and taking only what they plan to eat. Some schools set up a challenge waste-reduction goal and try to meet it. The objective is to make sure that the lessons of Low Waste Lunch Week go well beyond the week and affect students' behavior throughout the year.

Other PSRCP events include ecology fairs, community no-waste dinners or picnics, and Earth Day celebrations. Some recycling teams work with the PTA to bring environment-themed entertainers to these events. Here are some activities you may wish to consider:

- Tour of the school garden
- Home composting demonstration
- Student worm bin demonstration
- Show of arts and crafts made with recycled materials
- Students presenting skits, songs, and so on with recycling and conservation themes

Classroom Connections

Life Sciences

Composting, both regular and vermicomposting, provides hands-on lessons in the nutrient cycle. Students observe the decay of organic matter and watch how organic matter changes into a nutrient-rich substance for the garden. They see how adding compost to the soil helps sustain a healthy ecological balance. The organisms found in compost have fascinating characteristics and adaptations. Worms provide many opportunities to study animal anatomy,

digestion, and behavior. Students can also observe how compost changes in temperature and volume over time. Have students apply their math skills to graph these changes and then make predictions. In studying recycling, children learn how plant matter such as trees, cotton, and hemp can be made into paper, and how old paper is broken down to make new paper.

Math and Economics

Students at all levels can use math skills to analyze school waste data in various ways. Have students calculate waste amounts, project reduction potential, and estimate savings. Ask students to estimate their individual waste totals each day. Then have them make estimates of waste totals for the school, city, town, and state. As you develop the school recycling plan, students can help determine how many extra bins will be needed and how often they will have to be emptied.

Worm bins also offer many opportunities to apply math skills. For example, students can calculate worm reproduction rates and the volume of food consumed per day. Some schools have set up small student-run businesses that sell worms and worm castings to local gardeners.

Language Arts

There are many opportunities to use written and oral language skills throughout your school waste management program. Some schools sponsor essay contests about the need for taking care of the environment . In other schools, students write plays about the benefits of recycling and perform them for their parents. Many teachers use science journals in which students record their observations. See "Resources" (**page 16**) for suggested books about recycling, composting, and the environment.

Earth Sciences and Chemistry

By developing their understanding of how glass, plastic, and aluminum and various other metals are made and how they decompose, you can introduce students to materials science. Students learn the life cycles of certain materials, as well as how some materials are broken down to be reused. Students learn about the importance of understanding the local geology, how landfill sites are chosen, and what happens to the liquids, solids, and gases produced as the landfill breaks down.

In the garden, PSRCP students spend time observing different soil types and how they change when compost is added as an amendment. They also compare soil textures, study drainage, and learn more about erosion.

Social Studies

We can learn a great deal about a culture by looking at what it throws away. What did garbage piles created by Native Americans 1,000 years ago consist of? How do our garbage piles compare? Have students compare consumer habits in different countries. Encourage students to interview older family members about ways in which packaging has changed over the years.

Students can learn a great deal about a community's infrastructure by visiting a landfill or recycling plant. There, they can find out where different products go to be recycled and what they are turned in to. At school, they can study the workings of their own school community and what it takes to set up a schoolwide recycling program.

Taking on a community service component like the PSRCP also gives students an opportunity to learn about good citizenship and environmental stewardship.

Music and Drama

In recent years many musicians have recorded songs about taking care of the environment. These can be used along with the Public Schools Resource Conservation Program, or students can make up their own songs to perform for other classes or parents. Skits, plays, and musicals are big hits at community events for PSRCP schools.

Specific Curriculum

We encourage elementary schoolteachers engaged in the Public Schools Resource Conservation Program to use ***Create from Waste***, an activity guide developed by Life Lab Science Program, and ***Closing the Loop***, a curriculum developed by the California Integrated Waste Management Board. For upper-level students, we suggest that teachers use the ***Municipal Solid Waste Guide*** from Project Learning Tree.

5 Resources

Books for Students

Miss Rumphius. Barbara Cooney, New York, NY: Viking (1982).

Compost!: Growing Gardens From Your Garbage. Linda Glaser. Brookfield,CT: The Millbrook Press (1996).

Keeping Minibeasts: Earthworms. Chris Henwood, New York, NY: Franklin Watts (1988).

Squirmy Wormy Composters. Bobbie Kalman and Janine Schaub. Toronto, ON: Crabtree Publishing Company (1992).

Compost Critters. Bianca Lavies, New York, NY: Dutton Children's Books, Inc. (1996).

Wormology. Michael Elsohn Ross, Minneapolis, MN: Carolrhoda. Books, Inc. (1988).

Trash! Charlotte Wilcox, Minneapolis, MN: Carolrhoda Books, Inc. (1988).

Videos

It's Gotten Rotten. Cornell University Resource Center, 20 min., $25 (174 VIGFY, 1996)

Wormania!. Mary Appelhof, Billy B. and the Brennan Kids. Kalamazoo, MI: Flowerfield Enterprises, 1995. (26 minutes).

Kids Talkin' Trash. Alameda county Waste Management Authority, 1995. Distributed by the California Waste Management Board (14 minutes)

The Rotten Truth. Sunburst Communications, Inc. Pleasantville, N.Y., 800.312.7511, www.sunburst.com

Pamphlets

Free Pamphlets from Ecology Action (phone 831/423-4327 to request your copy): ***Composter's Resource Guide: The Santa Cruz County Guide to Finding Raw Materials,*** on composting, recycling, buying recycled and much more.

Mail Order Catalog

Gardening with Kids: Tools to Help Young Minds Grow. National Gardening Association 800.538.7476 www.kidsgardening.com

Websites

http://www.a-horizon.com/compost/compost menu.html. Rot Web: how-to composting information, offers teachers a place for postings and reading other schools' postings, good resource list.

http://www.cancentral.com/canc/abc.htm.ABC's: aluminum can recycling information, lesson plan ideas.

http://www.cfe.cornell.edu/compost/schools.html. Cornell University School Composting Site: detailed composting information, K-12 lesson plans.

http://www.consrv.ca.gov/dor/edu/index.htm. Recycle Rex Education Page, California Department of Conservation: good resource list, kids' activities.

http://www.ecoact.org/zero-waste/promax.html. Ecology Action of Santa Cruz. Re-use network—obtain a wide array of materials on this website.

Hotline

Household Hazardous Waste Collection Facilities 831.454.2606

The ROTLINE: 831.423-HEAP (4327)

County of Santa Cruz Recycling Information Line 831.454.2333

Books for Teachers

Let it Rot: The Gardener's Guide to Composting. Stuart Campbell, Story communications, Inc., Pownal, VT, 1990, 144 pp.

The Rodale Book of Composting. 1992. Grace Gershuny (Ed.), St. Martins Press, New York, NY, 278 pp.

Closing the Loop: Exploring Integrated Waste Management and Resource Conservation. California Integrated Waste Management Board. Sacramento, 2000.

Exploring Environmental Issues: Municipal Solid Waste. Project Learning Tree. Washington D.C.: American Forest Foundation, 1997.

The Wonderful World of Wigglers. Julia Hand. Montpelier, VT: Food Works (1995).

Let's Reduce and Recycle: Curriculum for Solid Waste Awareness. United States Environmental Protection Agency, Solid Waste and Emergency Response, 1990. EPA/530-sw-90-005

The No Waste Anthology: A Teacher's Guide to Environmental Activities K-12. Sacramento: California Department of Health Services Toxic Substance Control Program, Education and Information, 1993.

Worms Eat My Garbage: How to Set Up and Maintain a Worm Composting System. 1982. Mary Applehof, Flower Press, Kalamazoo, MI, 100 pp.

Worms Eat Our Garbage: Classroom Activities for a Better Environment. 1983. Mary Applehof, Mary Francis Fenton, and Barbara Loss Harris, Flower Press, Kalamazoo, MI, 214 pp.

The Worm Café: Mid-Scale Vermicomposting of Lunchroom Wastes. 1999. Binet Paine, Flower Press, Kalamazoo, MI, 180 pp.

Worms, Worms, and Even More Worms: A Vermicomposting Guide for Teachers.(pub #322-98-008), 1999. Anthony Eulo, 63pp. Distributed by the California Integrated Waste Management Board (CIWMB) Copies available free to CA teachers. Phone: 916.255-2385

Create From Waste: An Activity Guide. 1998. Developed by Life Lab Science Program, Distributed by the Resource Conservation Program of the Santa Cruz County Public Schools. Copies available free to Santa Cruz County teachers. Phone: 831.459-2001

Waste Haulers

Waste Management of Santa Cruz, 800-665-2209
City of Santa Cruz, 420-5220
City of Watsonville, 728-6133

To obtain additional copies of this guide please go to our
website at: www.wastefreeschools.org, or call
Ecology Action of Santa Cruz
(831) 426-5925

Printed on recycled paper.