

Oregon Green School Tools

Version 1.0

**Creating Healthy School Environments
through Resource Efficiency**

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The Oregon Green School Tool was created to use in conjunction with the Oregon Resource Efficiency Program and the Oregon Green Schools Recognition Program. This is a field-test version distributed during the 1996-97 school year. If you have any questions about this tool or the above mentioned programs, please call (503)229-6823, 1(800)452-4011, (or e-mail Joan.C.GRIMM@state.or.us) . If you have suggestions, comments or feedback on this document please fill out the enclosed evaluation form or call for a copy of the evaluation form. We appreciate any feedback or ideas you may have.



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I. Introduction

Preparing for the 21st Century Classroom

Oregon's schools are preparing for the 21st century by using resources wisely. Students, parents and teachers are demonstrating civic pride through a commitment to the environment.

The doors of the classroom are opening up! Schools are becoming learning laboratories where students participate in the world around them. As a result, students in 21st Century classrooms will learn by doing.

Many people working in schools today feel there are much bigger issues to deal with than what is in the garbage can. It is true, the challenges facing us today are complicated and tough. By understanding the value of resources — how to use materials, energy and water wisely at school and at home — the quality of a student's experience and their ability to learn in a safe and healthy environment is greatly enhanced.

Many schools look for a "formula" for setting up successful, long-term, resource efficiency programs. Because schools are a microcosm of the community that surrounds them (and, as such, each is a unique environment), formulas don't always work. Instead of offering a formula, Oregon Green School Tools provides five tools to help you reduce your use of materials, energy and water.

This tool is written for principals, custodians, teachers, students, parents, kitchen staff, site councils, classified staff, or school volunteers who are working on improving the health and livability of their school environment.

These tools include involving students in conducting resource assessments for materials, energy and water, identifying resource efficiency opportunities, planning, tracking, and reporting.

Making changes in the way your school consumes resources, e.g., materials, energy and water will take time, patience, and an ability to organize and inspire. It won't get done by one teacher, or one student, in one day, or in one month. It will require a commitment from everyone.

Why Reduce Your Waste?

Less waste equals more resources.

It almost seems too obvious a question. No one wants to be wasteful. But when it means changing the way you do something or spending a little money to save a little money, most people want to know why they should do it.

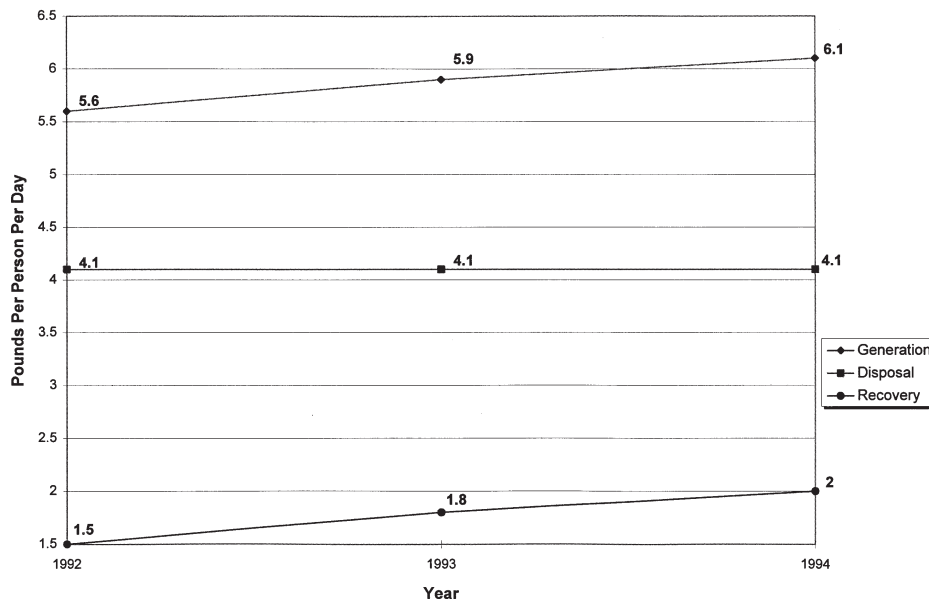
Americans generate more waste than any other country on earth. In 1994, a total of 209 million tons of municipal solid waste was generated in the United States.¹ That number does not include the waste generated by manufacturing.

Managing this growing pile of potential resources and solid waste is primarily the responsibility of local governments. As local taxpayers, we spend more than \$30 billion every year to have our “trash” taken care of (includes land filling, incinerating, recovering).²

In 1994 Oregonians generated a total of 3,437,255 tons of waste. In the past three years the amount of waste we generate has continued to increase. The amount of waste we *generate* includes everything we throw into a garbage can *plus* everything we recycle or recover. The waste generated per person in Oregon was 6.1 lbs per person in 1994. (See figure 1)

Notes:

Figure 1
Oregon Per Capita Recovery, Disposal and Generation Rates
1992 - 1994



¹ Characterization of Municipal Solid Waste in the United States: 1995 Update, Executive Summary, EPA, March 1996 EPA530-S-96-001

² The Garbage Primer, The league of Women’s Voters, Lyons & Burford 1993

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Oregon's goal is to recover 50 percent of its waste by the year 2000.³ In 1994 we recovered 32 percent of the material sent to landfills through recycling, composting and incinerating.

To reach 50 percent, we must focus our efforts in new areas such as commercial and institutional waste, organic (food and yard debris) and packaging waste. We must also begin to reduce our waste.

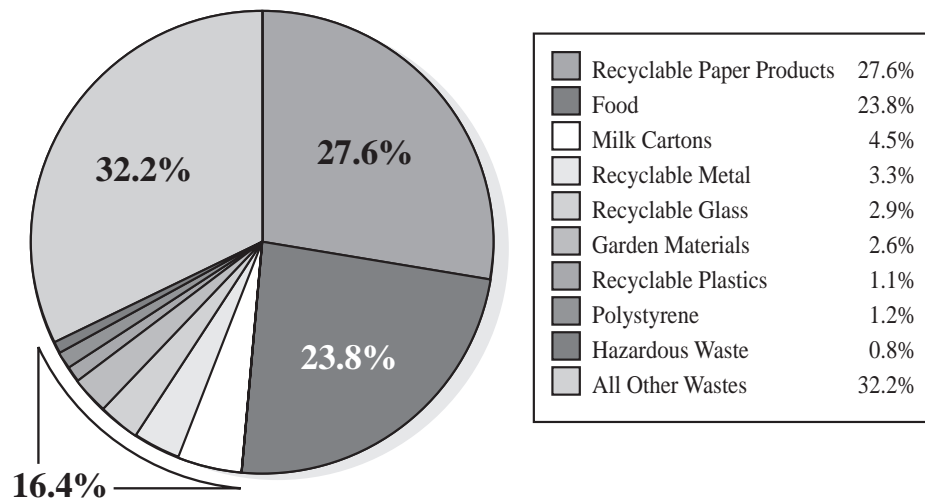
Schools are in a unique position to prove institutions can move beyond recycling and begin to prevent waste at its source.

That's what resource efficiency is: making the best possible use of resources to prevent wasting energy, materials and water.

There are 60 million students enrolled in kindergarten through college. Each student generates an estimated .08 to .12 tons of waste per year, or 4.8 million to 7.2 million tons of waste nationwide. This equals approximately 2.6-4 percent of the nation's waste stream.⁴

According to the Environmental Protection Agency's Education Waste Characterization Study, school waste consists of approximately 35 percent recyclable material⁵ (see Figure 2). However, some schools' waste is made up of as much as 45-50 percent recyclable material.

Figure 2
Average School Waste Stream



How much recyclable material is in your garbage can? How much water, energy and materials are you consuming? Are there opportunities to be more efficient and conserve these valuable resources?

Schools can play a special role in the challenge of moving us away from a "throw-away" society, toward one that values resources and conserves them for future generations. As students learn about resource depletion, they can also learn about resource conservation and practice it at home and at school.

³ recovering waste includes recycling, composting and burning waste to generate electricity

⁴ Making Less Garbage. INFORM, Bette K. Fishbein and Caroline Gelb, 1992

⁵ Education Waste characterization Study, EPA530-F94-042, 1993.

What Is Resource Efficiency?

Resource efficiency is using energy, water, and materials as efficiently as possible. It's about working smarter — which often means changing attitudes and behaviors. This is no small job because changes in our habits are difficult to tackle. Resource efficiencies can be operational, involving equipment changes, or they can be individual, involving changes in daily habits. Changes in the way we do things are often the most difficult. They take longer than buying a new piece of equipment and meet with more resistance.

Water and energy efficiencies are more effectively implemented at the facility/district level. However, many basic efficiencies such as turning lights and computers off when they are not in use and not letting the water run can reap savings and non-monetary benefits. Students and staff learn to make choices that demonstrate their respect for natural resources.

A resource efficiency program is more than a recycling program — it includes establishing an ethic of resourcefulness and changing wasteful behaviors. It requires looking at what is coming into your school (what you are purchasing), and what is going out (what you are throwing away). It also involves understanding that much of what we previously thought was waste, is actually a resource.

Waste reduction is any activity that eliminates or reduces the generation and disposal of waste. It includes three main strategies: reducing, reusing, and recycling.⁶

Reducing and reusing⁷ are at the top of Oregon's solid waste hierarchy because they prevent waste from being generated in the first place. This is the most powerful way to reduce waste. By not consuming an item in the first place, resources are conserved and waste is not generated. Reuse is making the most of the materials available to you.

Recycling is the remanufacture of secondary resources⁸ into a new product. Recycling is the third priority in an integrated resource management program because not only does it require energy and resources to recycle something, waste is also created by remanufacturing.

Closed-loop recycling describes the process of making a product is back into the same product. This type of recycling is ideal as it is the best use of the resource. Glass is an example of closed-loop recycling. When purchasing products made from recycled materials, it is important to read the label to see if the product contains pre-consumer or post-consumer waste. If post-consumer waste is used it is helping to keep materials out of the landfill.

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⁶ composting and burning waste to generate electricity are also strategies to reduce waste.

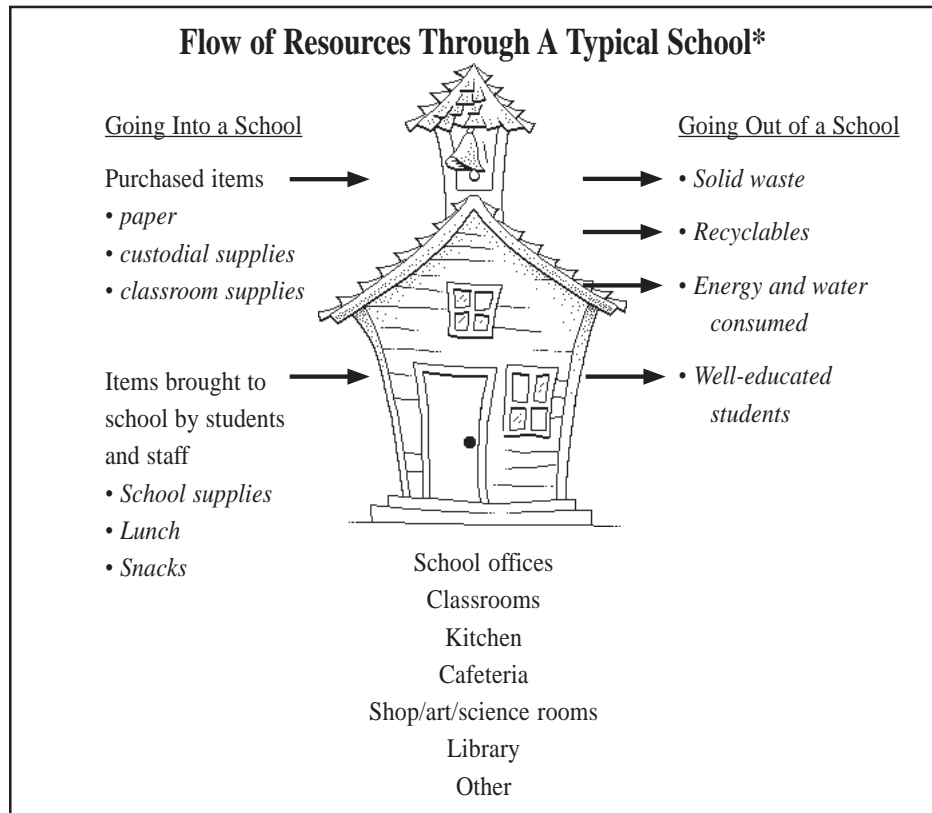
⁷ other terms are also used, e.g., source reduction and waste prevention

⁸ secondary resources are those resources used to re manufacture products like old newsprint or old corrugated cardboard.

Introduction

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Resource efficiency includes reducing, reusing and recycling. It provides an opportunity to look at the materials and natural resources flowing through your school and maximize their usefulness.



* Adapted from *setting up a Solid Waste Recycling Program in Schools, 1990*; J. Winston Porter, Sterling, Virginia. Call 1(800) 627-7646 for a copy.

Resource Efficiency: What's in it for you?

Students:

It's an opportunity for students to make decisions, and make a difference. When students assess and analyze data, they discover the link between understanding and solving a problem. Examples of their efforts can become important additions to samples of their work required for a CIM or CAM.

Teachers:

It's an opportunity to teach and learn. Resource efficiency activities provide excellent opportunities to integrate concepts using hands-on, "learn-by-doing" activities in math, science, social studies, health, art, and environmental studies.

Custodial and Kitchen Staff:

It's an opportunity to be environmentally friendly. Practicing resource efficiency can save money and conserve valuable resources.

Principals:

It's an opportunity to be recognized. Gaining recognition for your program not only strengthens the school but it strengthens your community by sharing the success of your achievements. Resource efficiency activities can result in new community partnerships.

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The Five Resource Efficiency Tools

A “stellar” resource efficiency program includes each of the points below. Although some of these points can be accomplished step-by-step, many overlap. An example of this is Point 4, tracking and reporting. Your tracking and reporting activities will overlap with your education/promotion and recognition efforts. This means that you will be accomplishing several tasks at a time. However, viewing them separately helps to stay organized.

Point 1: Involve and educate students and staff

A program that involves everyone is one that will last. Include your principal, custodian and kitchen staff in planning the program. Educate everyone about how the program works, then promote your achievements! Don’t be afraid to use peer pressure as a tool.

Point 2: Conduct resource assessments and waste audits

Knowing what your school is purchasing and using and what it is throwing away is important to setting up a program that will actually conserve resources. A resource assessment gets students involved and educates the school community.

Point 3: Write a plan to use resources wisely and reduce waste

A plan is an important tool for following through on the information you gather in the resource assessment. It is also very helpful in garnering administrative support and staying organized.

Point 4: Track and report your results

If you don’t track your activity, you won’t know how you are doing. You also won’t get any recognition for your accomplishments. You can track the results of your efforts without a lot of tedious paperwork.

Point 5: Make your efforts long-lasting

Build permanence into your program. You want it to last. Integrate the program so that it is part of the school’s “infrastructure.” Make sure you are not the only one committed to this program.



Point #1

Involve and Educate

You'll need help setting up your program and maintaining it — and then you'll need help taking credit for it!

Whether you are just getting started, or working on an improvement plan, you'll need a group that includes teachers, custodians, kitchen staff, students, and the principal to help you. They won't need to come to every meeting but they need to be involved at key points. You will want to have administrative and staff support early on.

Involving and educating are two of your most important tools. Students and staff will participate if they are well informed about the program and its benefits.

Four strategies for involving and educating :

- A. Form a group to plan and oversee
- B. Hold a kick-off event
- C. Plan to educate
- D. Gain recognition

A. Form A Group

Although one person can initiate these activities, one person can't do all the work. You need the knowledge and expertise of the people who are directly affected. You need to form a group. The group should be able to meet regularly during school hours and have their activities be part of their job or school work. The group's purpose will be to start the program or oversee improvements. Some schools form a Conservation Committee or an Environmental Team as part of the Site Council or Student Leadership class. However you form a group, set it up so when students graduate or staff changes, the program will continue.

The group's main duties will include:*

- Conducting resource assessments/waste audits.
- Writing a plan of action and implementing it.
- Setting up ongoing education and promotion activities.
- Tracking and reporting your results.
- Gaining recognition for your efforts.

** In some cases the group will be in charge of getting someone to fill these duties.*

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B. The Kick-Off Event

After you have performed the resource assessments, identified resource efficiency opportunities, and written a plan of action, you are ready to launch an event that will let everyone know what you are working on and how they can get involved. Your kick-off event gives your program visibility and generates enthusiasm.

Some Kick-off event ideas:

- Hold a Resource Rodeo or Fair with booths educating students and staff about resource efficiency.
- Produce a play or video about the importance of using resources efficiently.
- Hold a contest to see which class double-sides the most paper in one week.
- Hold a poster contest. Each class can produce a poster that shows what can/cannot be put into the recycling boxes and why it is important to conserve resources such as water, energy, and materials.
- Hold a school-wide assembly and have volunteers conduct a waste audit on stage. (See the next section for detailed information on conducting a waste audit.)

C. Plan to Educate

You need a plan for keeping everyone informed. Your education plan should include “progress reports” and curriculum elements. Progress reports will require a certain amount of tracking and waste auditing to periodically let everyone know how they are doing.

Teach and practice resource conservation concepts in the classroom. This will require researching available materials and recruiting teachers. Your group does not need to oversee that, but it needs to ensure it happens. (*See the Resource section for curriculum materials.*)

Set up an ongoing education program that’s closely tied to your resource efficiency goals. This should be included in your program plan of action.

Some ideas for your education program:

- Train students as Peer Tutors to teach others how to participate in resource efficiency activities.
- Write regular articles or broadcast morning announcements about your efforts and achievements.
- Have students present to the faculty, Site Council, or School Board, on the importance of reducing waste and how to participate in the program.
- Schedule classroom presentations, puppet shows, films, etc., on recycling. (See the Resources section in this guide for local government contacts.)
- Check your Rethinking Recycling Teacher Guide for more ideas. (See the Resource Section for ordering information.)

D. Gaining Recognition

Gaining recognition for your program motivates people to do even better. It raises awareness in the community, and people begin to think about what they could do in their home or office.

Start with internal recognition. Make sure the students, faculty, and volunteers who work hard at conserving resources are recognized in an assembly, or in front of the school board along with the Athlete of the Year or Volunteer of the Year.

Apply for grants and awards. They do not necessarily require extra work. If you use tracking tools you will have the information you need to fill out the applications. Make this the responsibility of one person in your group.

Some recognition program ideas:

- Establish a monthly traveling award and present it to the classroom with best record of resource conservation and waste reduction for the month.
- Keep track of the amount of recyclables collected. Show visually how it is increasing, and relate to resources saved.
- Keep track of the amount of resources you consume. Show how you are cutting your consumption of energy, water, or materials.
- Keep track of the amount of waste you throw away (in cubic yards). Show how it is decreasing.

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Resource Efficiency Tip:

Keep all important information such as resource assessment results and your plan of action in a central location such as the Library Resource Center.

Hazelbrook Middle School in Tualatin pioneered the Golden Garbage Can Award given to the class that kept recyclables out of the garbage can. It is presented during the monthly health assembly. The award provides incentive and fun and it promotes the waste reduction program on an ongoing basis.

These students also designed the Metro Earth Day billboard for 1995-96 with the slogan: Reduce, Reuse, Recycle, Close the Loop.

Notes:

Winston Looks Good

Sixth graders perform waste audits for businesses in their community as part of their School-to-Work Program. This not only provides students with a real-world challenge, but it also enhances the quality of life in Winston! Thanks to the students at Winston Middle School in Winston.

A picture is worth a thousand words.

Firgrove School in Beaverton, OR, did a waste audit and then used many of the things they found in the garbage can to create an “eye-catching” display.

This method of showing the students and staff what is being wasted makes them think.



Point #2

Conduct Resource Assessments and Waste Audits

A resource assessment is both a “walk-through” look at what is coming into your school and an audit of what is going out the door in the garbage can. The resource assessment includes what you are purchasing and consuming. The waste audit (or evaluation) is a detailed look at what you are throwing away. Your assessment and audit can be integrated into a science, math, or social studies class.

New common curriculum goals and content standards in science include using basic scientific process skills to observe, measure, use numbers, classify, question, infer, hypothesize, and communicate. Within Science in Personal and Social Perspectives, students will need to “describe how the daily choices of individuals, taken together, affect the global resource cycle, ecosystems, and natural resource supplies.”⁹

When examining the resources you consume ask these questions:

- Do we need this?
- Can we use less?
- Can we reuse it?
- Can we recycle it?
- Can we use it more efficiently?

The only things that should be in the garbage can are those materials that have no value — that’s what garbage is. Materials that cannot be recovered and do not need to be handled separately, i.e., hazardous products.

Follow the instructions in the Worksheets Section. In a school, most waste is generated in classrooms and in the cafeteria. In some schools, half of all garbage thrown away in one day is generated in only two hours during lunch! This is where you will want to start.

Other areas you will want to examine are: offices, shop/automotive and/or art rooms, district printing departments, the kitchen and supply areas.

The information you gather from the resource assessment and the waste audit is what you use to:

- Write a plan of action.
- Track your program.
- Gain recognition for the school’s efforts and accomplishments.

After conducting the resource assessments and auditing your waste, fill out the Summary Information Worksheet. Now you’re ready to write a plan of action!

⁹ First Reading Common Curriculum Goals and K-10 Content Standards, June 18, 1996 Oregon Department of Education.



Point #3

Write a Plan to Use Resources Wisely and Reduce Waste

A resource efficiency plan defines a strategy for incorporating material, energy and waste conservation into the operation of your school. The purpose of the plan is to identify resource efficiency goals and define a series of actions designed to achieve those goals.

The time to write your resource efficiency plan is after you have formed a group, obtained administrative support, and conducted resource efficiency assessments and waste audits. The plan should be written by your group. It could include:

- A school environmental policy or ethic statement.
- Quantifiable goals that state how much material, energy, and/or water will be reduced. Include a deadline or benchmark to track your progress.
- A criteria for selecting which resource efficiency measures, identified by the resource assessments, you will implement.
- The resource efficiency measures you select.
- The specific actions you plan to take. List tasks and include a deadline and identify the person(s) responsible for that task.
- A provision for evaluating your efforts and revising your strategies.

You will find a Plan of Action Worksheet and a sample in the Worksheet Section.

Notes:

Example of an Environmental Policy:

The board, administration, faculty, staff, students, and parents of XYZ School believe it is essential that school operations ensure the most efficient and highest use of our resources. Resource efficiency methods such as waste prevention, reuse, recycling, composting, and buying recycled materials will be practiced whenever possible.

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Point #4

Track and Report Your Results

There are many ways to track resource efficiency efforts without a lot of extra effort. Energy and water efficiencies can be tracked only by your school district's facility manager. Call your district office to see if you can get information about resource use. Some districts have programs and special resource accounting tools that allow them to track water and energy use very closely.

Material waste is quantified by volume and/or weight. Your school's waste containers are measured in gallons (32 gallons, 60 gallons, and 90 gallon "roll-carts") or in cubic yards (usually in 2, 4, 6, or 8 cubic yards).

Multiply your container size by the number of pick-ups per week and get a total waste disposed per week number. For example:

$$4 \text{ cubic yards} \times 5 \text{ pick-ups/week} = 20 \text{ cubic yards of waste disposed per week.}$$

This number can be converted to tons by multiplying it by .15:

$$20 \text{ cubic yards} \times .15 = 3 \text{ tons of waste disposed per week.}$$

In addition you can determine the amount of waste disposed per person each week. This can be done by converting tons to pounds:

$$2000 \text{ lbs} \times 3 \text{ tons} = 6,000 \text{ lbs disposed per week}$$

Now divide the number of students into the number of pounds:

$$6,000 \text{ lbs per week divided by } 500 \text{ students} = 12 \text{ lbs/student/week}$$

or

$$2.4 \text{ lbs per student per day.}$$

Many award programs will ask for specific information about the amount of waste or resource reduced and/or the amount of waste recycled. Use the totals from your Waste Evaluation Forms and put them into the Summary Sheet. Update this information each year. This is an excellent way to track the school's progress. Keep that information in a centrally-located binder.



Point #5

Make Your Efforts Long-lasting

While you are setting up your program, it's important to think about how your program will survive staff and student turnover. If you include ways to train new people and continually monitor your results, and periodically report back to students and staff, your program will last longer.

The most important part of permanence is including the activities outlined in this guide into the permanent operation of your school.

Five ways to make your waste reduction program permanent:

- Adopt a school environmental policy and include in the school's handbooks. Make becoming a Green School part of the School Improvement Plan.
- Divide the duties to promote/educate, collect recyclable materials, monitor results, and reward people for their efforts evenly throughout the school population. Make the activities an established and recognized part of staff job descriptions.
- Integrate waste reduction education into your school's curriculum at one or several different grade levels.
- Create a plan to train all members of your school community including kitchen and custodial staff, faculty, and students.
- Create signs, written educational materials, and regular updates on your program to keep it visible and make it easier for people to participate.

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Worksheets for Materials, Energy and Water Assessments

Materials Assessment

How to use:

- Ask yourself the questions in the assessment. Circle “Y” for yes or “N” for no as appropriate for each question.
- For every question you answered “yes”, there may be an opportunity to reduce waste. See the accompanying “opportunity” note.
- All of the questions that you answer “yes” to can serve as a short list of potential opportunities.
- For measures that don’t require additional study, go directly to implementation.
- For measures that do require additional study, determine what information you need to make a decision and where you will obtain that information. You may want to involve your suppliers, garbage, and recycling companies, or your School/District Facility Manager.
- Use the Notes column to keep track of any ideas you may want to pursue or to write down next steps.

Materials Assessment — Office Areas

Notes:

Question	Answer	Opportunity
When you write a document using a computer, do you print out several drafts to edit before producing the final copy?	Y N	You can reduce the amount of paper you use by proofing documents on the computer screen before printing, and storing final documents on disk rather than making hard copies.
Do many people in your school use computers?	Y N	Consider developing a computer “conservation tips” card to help people use their computers effectively.
Does your computer printer discharge an extra sheet of paper before each print job?	Y N	Check the printer manual to determine how to eliminate the extra sheet of paper. If your manual does not address the issue, call the manufacturer.
Are the documents produced by your computer printer single-sided?	Y N	Many printers now have double-sided printing capabilities. Next time you buy a new printer, look for this feature. If your printer does not double-side documents, you may be able to do it manually.
Do you purchase new fax and printer toner cartridges?	Y N	Recharge old cartridges instead of buying new ones. There are many qualified companies that will take back used cartridges and sell recharged cartridges at a lower cost than new cartridges. Be sure to ask companies that sell recharged cartridges for references so you can check the quality of their service.
Are most of your photocopies single-sided?	Y N	Many copy machines have a built-in duplex mechanism that makes copying on both sides easy. If your copier doesn’t have this feature, you can still do it manually. The reduction in the amount of paper you purchase may well be worth the extra time it may take.
Do you usually use new paper for drafts and non-essential documents?	Y N	The clean side of discarded sheets of paper can be used for draft documents (you might want to mark a slash or X on the printed side to avoid confusion). Fill the second tray of your copier with used paper so it can be selected easily.
Do you have a central copy center or send projects out to a print shop for copies?	Y N	Require your central copy center to make all copies double-sided unless otherwise specified or request double-sided copying for all jobs sent to a print shop.
Do you use a facsimile (fax) machine?	Y N	Reduce or eliminate the cover page by designing it to be as small as possible and still leave room for a message, or purchase a stamp to use on the first page of the fax to convey transmittal information when a message is not necessary.

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Materials Assessment — Classrooms

Question	Answer	Opportunity
Does your office use a central filing system to eliminate duplicate files?	Y N	Save paper and space in your office by using or creating a central filing system instead of maintaining duplicate personal files.
Do you send materials (brochures, etc.) to parents?	Y N	Cut your printing costs and help your parents reduce waste by keeping your mailing list current. Frequently check distribution lists for parents who have moved, changed address, or no longer need your information.
Do you receive newspapers or other publications?	Y N	Regularly review subscriptions and circulation lists and ensure that they are accurate and still appropriate. Also, ask your co-workers who subscribe to the same publication if they would be willing to reduce to one subscription and circulate the copy.
Do you have electronic mail?	Y N	Use the electronic mail system to send messages whenever possible instead of written memos.
Does your school use carbonless forms?	Y N	Evaluate whether forms can be condensed, consolidated, or reduced in size (e.g., triplicate to duplicate).
Does your school purchase new note pads and phone message pads?	Y N	Keep discarded sheets of paper that still have one clean side for note and phone message pads. Many print shops will cut the paper and glue one end together at a fraction of the cost of new note pads.
Do you purchase file folders?	Y N	File folders can be easily reused by turning them inside-out or by covering the tab with an adhesive label.
Are the trash cans in your office filled with letters, memos, and drafts of reports?	Y N	Set up or expand the paper recycling program at your business. Many types of paper are now accepted for recycling, such as envelopes, fax paper, and magazines. Check with your local recycling depot, recycling company, garbage hauler, or city/county recycling coordinator to find out what is accepted in your area. It is easy to set up a recycling program and the potential savings on disposal should make it well worth the effort.
Do you separate single-sided paper out and use it for classroom assignments, scrap paper, draft paper?	Y N	Set up scrap paper boxes in each classroom. Make them visible and attractive. Get teachers to encourage their use.

Materials Assessment — Kitchen/Cafeteria/Break Room

Notes:

Question	Answer	Opportunity
Is the trash can in your break room full of paper coffee cups and disposable dishes?	Y N	Purchase a set of permanent dishes for your office or encourage people to bring in reusable coffee mugs. If you have a cafeteria that uses disposable dishes, consider switching to permanent dishes.
Do you have a soda pop machine in your cafeteria or do people bring in cans from home or the local deli?	Y N	Set up a recycling program for aluminum cans. At 5¢ each your school could earn more than \$4,000.00 each year (based on 500 cans per day at 5¢ each).
Do many people bring in their own lunches?	Y N	Set up a recycling program in the break room or cafeteria for glass containers and tin cans. Check with your local recycling depot or garbage hauler to find out what other materials are accepted for recycling.
Do you have an onsite cafeteria or kitchen?	Y N	Consider the following waste reduction measures: Use bulk dispensers for condiments, rather than individual packages. Use bulk dispensers of drinks (milk, juices, beers) rather than individual cartons or cans. Use durable towels, tablecloths, napkins, dishes, flatware, cups, etc. Recycle or reuse cardboard boxes, glass, metal, and plastic containers. Donate leftover foods to charities. Compost vegetable food scraps.

Worksheets

Notes:

Materials Assessment — Other

Question	Answer	Opportunity
Do you have a comprehensive recycling program but still find a lot of material in the trash cans?	Y N	Avoid buying products that are not easily recyclable in your area. Make sure recycling is convenient by placing clearly labeled recycling containers in all work areas. Promote recycling to all employees. Make a poster or label that lists or even shows what can and can't be recycled.
Are the trash cans in the restroom full of paper towels?	Y N	Instead of paper, switch to cloth roll towels or air dryers in the restrooms, or switch to a dispenser that isn't so generous with paper towels. This will cut down on the amount you spend for janitorial supplies and reduce your disposal costs.
Is the area around your business landscaped?	Y N	Ask the company that does the landscaping to recycle the grass clippings and prunings. If you do not use a landscaper, buy a mulching mower and recycle grass clippings by leaving them on the lawn or start a compost pile and include prunings and leaves along with grass clippings.
Do you need new equipment?	Y N	Whenever possible repair rather than replace office equipment. If the equipment is beyond repair, consider purchasing remanufactured or used equipment. Donate used equipment to a school or charity.

Energy Assessment

How to use:

- Ask yourself the questions in the assessment. Circle “Y” for yes or “N” for no for each question.
- For every question you answered “yes”, there may be an opportunity for energy efficiency. See the accompanying “opportunity” note.
- For measures that don’t require additional study, go directly to implementation.
- For measures that do require additional study, determine what information you need in order to make a decision and where you will obtain the information. You may want to involve a lighting contractor, your energy utilities, and/or your School/District Facility Manager.
- Use the “Notes” column to keep track of any ideas or write down possible next steps.
- Find out if your building has had an energy assessment performed before. What were the results? What recommendations were and weren’t implemented, and why?

Notes:

Notes:

Energy Assessment — Lighting

Question	Answer	Opportunity
If you use fluorescent lamps, are they “T-12s”?’ ¹	Y N	Changing to energy efficient T-8s and electronic ballasts can cut electricity use as much as 40%, while reducing flicker and improving color rendition. Since some T-8s are brighter than T-12s, you may also be able to save even more money and electricity by “delamping” (removing lamps from fixtures). Retrofit payback for a typical office is usually 1 to 4 years
If you use T-12s, are they 40-watt lamps? (The wattage is labeled on the lamp.)	Y N	Even without a retrofit to T-8s, T-12s are also available in 34 and 32 watts. These use 20% less energy and emit about 5 - 10% less light.
Are your fluorescent light fixtures covered with a bumpy, textured sheet of opaque plastic?	Y N	A grid reflector could replace the plastic sheet, and will direct more light down onto work areas, where light is needed, and direct less light onto walls and the ceiling. This may increase comfort, and may allow you to switch to a lower wattage lamp, or remove some lamps, without decreased light levels.
Do you use incandescent “screw-in” light bulbs?	Y N	Over its 10,000-hour life, one compact fluorescent can save you \$7 (at electricity rates of \$0.05/kWh). Many compact fluorescents have the same yellowish “glow” associated with conventional incandescent light bulbs.
Does your school have recessed downlights (also called “can lights”)?	Y N	Conventional incandescent light bulbs and even flood lights in a recessed downlight are inefficient, because much of the light is trapped inside the fixture. Incandescent lamps, or compact fluorescents with a reflector, are preferred for recessed downlights, since they use 20 to 70 percent less energy.
Do you light parking lots, sidewalks, other outside areas, warehouses, gyms, or other large rooms, or use floodlights?	Y N	High intensity discharge (HID) lights, including metal halide and sodium, are more energy efficient than standard fluorescent lights.
Are your exit signs lit with incandescent bulbs?	Y N	When you go to replace your exit lights, use a LED or compact fluorescent replacement kit. Payback is typically 1 to 5 years, not including labor savings, and the compact fluorescents have a much longer life.

Energy Assessment — Lighting

Notes:

Question	Answer	Opportunity
Has it been more than 2 years since your lighting fixtures were cleaned?	Y N	Dirt and dust can accumulate on lights and reflectors, reducing light levels up to 25%. Cleaning lights and fixtures every two years keeps light output high, and may allow you to change to lower wattage bulbs or delamp some lamps with no loss of light level.
Are lighting levels in your work areas bright?	Y N	Your facility may, in fact, be over-lit. You may be able to gradually delamp or retrofit with lower wattage lamps in some areas. Alternatively, use a light meter to measure lighting levels at various work surfaces, and compare to standards that your utility or community's Resource Efficiency Coordinator can provide.
Do you have areas which are not used all of the time (closets, conference rooms, bathrooms, storage areas, etc.)? Do you have work areas which are lit sometimes by natural light?	Y N	Day lighting controls, such as a photoelectric sensor, are available to turn lights on only when needed.
When your facility is being cleaned, do cleaning staff turn on all of the lights?	Y N	If possible, ask them to light only the areas where they are working and turn the lights off when they leave.
Are lights left on when your building is unoccupied (evenings, weekends)?	Y N	Consider occupancy sensors or a 7-day, 24-hour timer/clock with an override mechanism.

Notes:

Water Assessment

How to use:

- Ask yourself the following questions. Circle “Y” for yes or “N” for no for each question.
- For every question you answered “yes”, there may be an opportunity for water efficiency. See the accompanying “Opportunity” note.
- All of the questions that you answered “yes” to can serve as a “short list” of potential opportunities.
- For measures which don’t require additional study, go directly to implementation.
- For measures which do require additional study, determine what information you need in order to make a decision, and where you will obtain that information. You may want to involve your plumber, irrigation/landscaping contractor, HVAC contractor, water utility, and/or your School/District Facility Manager.
- Use the “Notes” column to keep track of any ideas or write down next steps.

Water Assessment — Restrooms

Notes:

Question	Answer	Opportunity
Were toilets installed prior to 1993?	Y N	<p>All new toilets installed beginning in 1992 are ultra low flush (ULF) toilets that use 1.6 gallons per flush. Older toilets use 3 to 7 gallons per flush. A retrofit to a ULF toilet may be cost effective if toilet use (and thus water use) is high, and your school is billed for water and waste water fees.</p> <p>If you choose not to replace toilets with ULF models, there are some low-cost opportunities to reduce water use, although these are less effective. You can reduce the use of water by installing valve replacements or displacement devices (If your toilets have tanks, use bags or dams; don't use bricks, as they deteriorate).</p> <p>If your toilets have flushometer valves (tankless), flushometer retrofit kits are available that reduce consumption by about 1 gallon per flush.</p>
Has it been more than 6 months since you tested your tank toilets for leaks?	Y N	Put 10 drops of food coloring in the tank and wait 10 minutes. Color will appear in the toilet bowl if a leak exists.
Does your school have urinals installed prior to 1993?	Y N	Flushometer kits are available that reduce consumption by about .5 gallons per flush.
Are your school's toilets set to flush at regular intervals?	Y N	Consider disabling this device, or installing a time clock so that they don't flush during hours when the school is not in use.
Does your school have showers?	Y N	Low flow shower heads and on-off interrupters are a low-cost method to reduce your energy, water, and waste water bills.
Do your faucets have threaded nozzles?	Y N	Low flow faucet aerators are a low-cost, easy to install method to reduce your energy, water, and wastewater bills.

Notes:

Water Assessment — Kitchens

Question	Answer	Opportunity
Does your kitchen have a commercial dishwasher?	Y N	<p>Several water-saving options may exist:</p> <p>Recirculate rinse water to the initial wash cycle.</p> <p>Recirculate rinse water to the garbage disposal.</p> <p>Wash full loads only.</p> <p>Check flow rates and reduce them if higher than the manufacturer’s specifications.</p> <p>Be sure that the flow of water through the dishwasher stops when the flow of items being washed stops.</p> <p>Replace spray heads to reduce water flow.</p> <p>Turn dishwasher off when not in use.</p>
Are you planning to replace the dishwasher?	Y N	Newer high-efficiency models can save you money on energy, water, and waste water bills.
Does your kitchen use a commercial garbage disposal?	Y N	<p>Several water-saving options may exist:</p> <p>Use rinse water from the dishwasher.</p> <p>Reduce water flow rate to the disposal.</p> <p>Turn off water flow when disposal motor is turned off. Use a solenoid valve for water supply lines to both the bowl and the grinding chamber.</p> <p>Replace the disposal with a garbage strainer.</p> <p>Scrape food into barrels.</p>
Does your school have water-cooled ice machines?	Y N	Air cooled ice machines will use less water (but may use more energy). If you choose to stay with the water-cooled ice machine, check flow rates (at the drain) and reduce using a flow restrictor if flow is higher than manufacturer's specifications. Also, be sure that cooling water shuts off when the compressor isn't running.
Are there sinks used for washing produce, dishes, and hands?	Y N	Consider installing faucet aerators, “closing” faucet aerators, or hand-held spray nozzles unless large, fast flows of water are needed. Higher pressure water will perform the same job, and reduce water and energy bills.
Does your school have coffee, milk, or soda dispensers with drain trays?	Y N	Consider turning off the continuous flow used to rinse the drain trays.

Water Assessment — Landscaping

Notes:

Question	Answer	Opportunity
Does water from irrigation run off onto streets, parking lots, or storm drains?	Y N	Soil is saturated and watering time should be shortened and/or sprinklers adjusted
Do you use an automatic sprinkler system?	Y N	<p>Consider installing automatic soil moisture overrides.</p> <p>Check to see if spray heads are delivering water to sidewalks, walls, parking lots, or other non-landscaped surfaces.</p> <p>Check to see if spray heads overlap; you may be over watering some areas in order to deliver enough water to all areas. Consider realigning sprinkler heads.</p> <p>Clean sprinkler heads periodically to remove mineral deposits (if you are in an area with hard water).</p> <p>Inspect the system for leaks in pipes, couplings, and faucets.</p> <p>Adjust sprinkler timing cycles with the seasons.</p>
Are your irrigation timers set by guesswork?	Y N	You may be over watering, and inflating your water and waste water bills. Try reducing irrigation times and/or frequency, or consult with a landscape architect.
Do you water during the day?	Y N	Watering early in the morning or around sunset will reduce evaporation loss.
At the time you normally begin irrigating, dig a hole or stick a probe an inch into the soil. Is it damp?	Y N	You may not need to water again until the top inch is dry.
Do you have small, oddly sized pieces of turf grass?	Y N	Turf typically requires more water than other types of landscaping. Small, odd sizes are extremely difficult to water efficiently. Consider replacing the turf with landscaping that is more tolerant of drier soils.
Do you have large areas of turf grass or non-native flowers and shrubs?	Y N	Consider reducing the area of turf and landscaping with native plants. This can reduce water consumption, fertilizer, herbicide, and pesticide use, and provide food and shelter for native song birds.
Do you have beds of shrubs and trees?	Y N	Drip irrigation will deliver water more efficiently than spray nozzles or sprinklers.
Is the soil around shrubs, flowers and trees bare?		Two to three inches of mulch will help to conserve water (reducing irrigation needs) and reduce weed growth, erosion, and soil loss.

Notes:

Step-by-Step Waste Audit Instructions

Garbage is measured by how much it weighs and by how much space it takes up (volume). You're going to estimate the volume and measure the weight of the materials you find in your school's garbage cans.

Materials you will need:

- Rubber gloves.
- Clip board and garbage evaluation forms.
- Large tarp(s) to place sorted materials on.
- Large plastic bags to weigh garbage .
- Scale to weigh garbage.
- Five-gallon buckets (three or four).

Three easy steps

Step 1: Choose the areas to evaluate and collect the garbage.

Collect the garbage at the end of the day and set it aside to audit the next day, unless you are doing the audit after school.

Step 2: Assign tasks.

If you are examining several areas, assign a team of students to each area. If you are examining only one area, give each student one of the evaluation tasks listed below:

Sorters: You need three to eight students to sort materials into categories.

Weighers: You need one to two students to weigh materials.

Recorders: You need one to two students to keep track of the weights and volumes.

Step 3: Do the Audit!

Carry the garbage you are evaluating to a place where you can sort the garbage on the tarp. The parking lot next to the dumpsters is best (if it's not windy or raining).

- Weigh each can of garbage. Then dump out the garbage and weigh the can without the garbage. Subtract the weight of the empty can from the weight of the filled can. This gives you a total garbage weight.
- Now sort the garbage. Group materials into categories listed on the Waste Audit form. These material categories are a general guide. If you have very few of some items, you can combine them into categories such as paper, plastic, etc. If you find a lot of one item, such as paper bags or whole sandwiches, make that a separate category.

- When you're done sorting, estimate the volume of each material. Volume is the amount of space the garbage takes up. Use five gallon buckets to estimate volumes. Pack the material slightly. Volume is important to know because it tells you what is "filling up" the school's dumpster.
- Next, take each pile of sorted material and weigh it. Remember to subtract the weight of the bucket.
- Record the weight. If a bag doesn't weigh enough to register on the scale, count the number of items. For example, a pile of plastic baggies won't have any weight. Count them and write down the number of baggies you find.

At the end of your evaluation, make sure your weights add up to the total garbage weighed. Your volumes should add up to the total gallons evaluated. The percentages of your weights and volumes should add up to 100 percent.

Waste auditing tips

- Every day is different when it comes to garbage. Make notes about things that could affect how much garbage is in the can. Are a lot of students absent today? Is it a "Clean Out Your Locker" day?
- As you sort and weigh materials, think about and discuss ideas for ways to reduce (or prevent), reuse or recycle the materials you find. Write down these ideas. They will come in handy when you write your plan of action. This could be a follow-up activity.

Notes:

Notes:

Waste Audit Form

Area of Audit (check one)

School _____

Classroom Staff room

Name _____

Playground Shop

Date/time _____

Cafeteria Kitchen

Other _____

Total Weight and Volume

You need to determine the total weight of the garbage you are evaluating. If you have several containers, weigh each one and enter your totals in the spaces below.

Total weight of full container(s) _____

Subtract weight of empty container(s) _____

Total weight of garbage _____

Total volume of garbage in container _____

What's In the Can?

List items separately or combine categories that have small quantities.

Item/Material type	Weight		Number of Items	Volume	
	Pounds	% of total		Gallons	% of total
Paper					
white, colored _____					
computer _____					
cardboard _____					
paper bags _____					
junk mail _____					
magazines, catalogues _____					
milk cartons _____					
newspaper _____					
paper cups, plates _____					
Plastic					
plastic baggies _____					
plastic trays _____					
single-serve items _____					
plastic-ware _____					
Metals					
aluminum cans _____					
tin cans _____					
scrap metal _____					
Glass					
Food					
Totals _____					

Factors affecting the amount of garbage. _____

Resource Assessment Summary Form

Use the information from your resource assessments and waste audit to fill in the blanks below. Make a photocopy of this form so you can update it each year. The information on this sheet can be used to report your assessment results, create a plan of action, and report achievements when applying for grants and awards.

Information about the total amount of waste disposed can be obtained from your garbage hauler. They can tell you the size of the container and how many times it is picked up. Ask them if it is full when it is picked up. You may be able to reduce the number of pick-ups each week by one or two. This can result in savings. Also, talk to your District Office Facility Manager to find out how much your school spends each year on garbage, water and energy.

Information on activities during the _____ school year.

1. Total waste disposed per week: _____ cubic yards
2. Total waste disposed per student per week: _____ lbs/p/student/p/week
3. Total percentage of recyclables in the garbage can: _____ % by weight
_____ % by volume
4. Average amount of recyclables collected each month _____ weight
_____ volume
5. Amount of waste reduced or diverted this year: _____ cubic yards or gallons
6. Amount of money spent on waste hauling: \$ _____
7. Amount of money spent on water/sewer: \$ _____
8. Amount of money spent on electricity: \$ _____
9. Amount of money spent on Natural Gas: \$ _____
10. Top five resource efficiency opportunities

Notes:

Suggestions: After you have tracked this information for more than one year, have students graph the results over time. Work with the numbers and come up with your own variations on presenting your achievements.

Resources

Notes:

Sample Worksheet for Developing a Simple Resource Efficiency Plan of Action.
Photocopy this sheet and use as an outline for each efficiency measure you target.

I. Goals			
II. Tasks, Timeline, and Responsibilities			
Specific Steps	Responsibilities	Timeline	Other/Notes
Efficiency Measure:			
III. Evaluation			

Resources

Notes:

Reducing and Reusing — Opportunities Waiting to Happen

Good choices in the cafeteria.

There are many ways to reduce cafeteria waste. Offer vs. Serve gives students an opportunity to choose what they eat by offering multiple entrees and setting up salad bars. This can result in a 50-90 percent reduction in food waste (see the resource section to find out more about Offer vs. Serve).

Give me liberty and give me a choice.

Sunnyside Elementary in the Portland School District implemented “Offer vs. Serve” and “Meal Choices.” The result was a decrease from 70.2 lbs p/day to 22.3 lbs p/day in the average amount of food waste generated in one day. When prepared food is thrown away you lose the money it took to purchase, prepare, serve and haul it away.

It’s cool to reuse in school.

Encourage students to bring their lunch to school in reusable containers. Have a Lunchbox Contest with several categories of prizes including, “most unusual,” “most functional,” “best design,” etc. Have students make cloth lunch bags from recovered materials and print a resource efficiency logo on them. They can be sold to students and their families.

Lead by example.

Provide reusable trays, silverware, glasses and coffee mugs in the lunchroom instead of disposable items. Reuse milk cartons, metal cans, etc., from the cafeteria for student “inventions” or projects.

Lunches and breaks.

Encourage faculty, staff, and students who bring lunches from home to use reusable containers. Provide staff dishwashing soap, hand towels, and scrubbers for cleaning these items and encourage them to bring mugs from home.

The worms ate it.

In the 1994-95 school year, students at Walterville elementary separated their food wastes and fed them to red wiggly worms which diverted more than 2,400 pounds of food waste from the landfill. They learned about worms and at the end of the year they had a rich fertilizer to use in the school garden!

Both sides now!

Encourage students and faculty to use both sides of their paper. Set up a scratch paper box in each classroom for students to use for notes or assignments.

Resources

Notes:

Paper saving capers.

Save on paper by using chalkboards or overhead projectors for student worksheets, quizzes, etc. Have students answer questions on scrap paper rescued from the garbage. Ban one-sided paper from the recycling bins.

Make your own scratch pads.

You can collect one-sided paper and turn them into scratch pads. Although prices vary, you can make them for 25 percent less than buying new ones. This sends an important message to everyone about reusing.

Communications.

Use bulletin boards and the PA system for morning announcements. Use alternatives to paper communication among staff, such as electronic and voice mail.

School store.

Sell overstocked or obsolete supplies and equipment to students, employees and their families. Be sure your school store purchases bulk and reusable supplies, narrow-ruled notebook paper, and environmentally friendly merchandise like recycled paper (with post-consumer recycled content) for students to buy.

Reuse supplies and classroom papers.

Students learn by example. Set up Reuse Areas in classrooms, encourage students to use materials wisely.

Get the community involved.

Encourage less waste by holding a fund-raiser to sell school mugs and cloth lunch bags to parents and community members.

Hold community swap meets.

Sponsor a school swap meet or exchange day. Some school districts have “clothing closets” where families can donate outgrown, usable clothing, shoes, books, toys, coats, etc. for use by other students. Turn this into a fun event.

Auction action.

Host a lost and found auction at the end of the school year to ensure that items left at the school do not have to be thrown away. Some schools hold an annual bazaar that includes requesting used item donations from students, families, and community members. Other schools are actively involved in donation drives for charitable groups to encourage the reuse ethic in students and families.

That “junk” is worth something!

Every year the Catlin Gabel School in Portland, Oregon, holds one of the largest rummage sales in North America. It lasts for three days and the school earns thousands of dollars for scholarships.

Magazines.

Find an organization that needs or has used magazines. Use them for art projects or deliver them to hospitals, clinics and retirement centers.

Keep the copy machine in check.

Make double-sided photocopies to reduce the amount of paper used. Purchase double-sided copiers. Do not ask for more printed copies than you need.

Vending machines.

Ask machine vendors to minimize packaging and, wherever possible, to use recyclable or reusable packaging in the machines. Better yet, go natural and fill machines with fresh fruit, which needs no packaging.

Documents.

Store documents on computer disks and reduce the number of hard copies made. Use route slips to circulate copies instead of making multiple copies.

Direct mail.

Sponsor a drive to reduce direct mail to both the school and homes in your area. Write to the Mail Preference Service (Direct Marketing Association, Box 3861, Grand Central Station, New York, NY 10163-3861) for name removal forms to distribute throughout your neighborhood.

Buy recycled.

Buying recycled products stimulates markets for recycled items which strengthens the whole recycling loop. The State of Oregon Department of Administrative Services maintains listings of contract suppliers who have recycled content products through their Vendor Information Program (VIP). Call (503) 378-4649 for more information.

Some purchasing guidelines.

Establish environmentally friendly guidelines for all purchases. Example: Whenever possible, XYZ school will purchase products that are made from recycled materials with minimal packaging, that can be recharged, refilled, or reused, have longer lifetimes, can be easily repaired; and/or that conserve energy/water.

Shipping containers.

Have your suppliers ship your orders in returnable, reusable pallets, boxes and containers. If reusable containers are not available, ask for containers that are recyclable.

Notes:

Resources

Notes:

Ordering Materials/Supplies.

Buy in bulk, larger sizes, or in concentrated form whenever possible. Order refillables and rechargeables instead of disposables (pens, batteries, toner cartridges for copy machines, etc.). Request that less or no individual packaging be used in your shipments.

Landscaping and grounds maintenance debris.

Work with your landscaper or maintenance staff to build a compost pile or arrange to send yard debris to a commercial composter rather than a landfill. Reuse the resulting product to improve your school's landscaping. Call your hauler or city to find out about local curbside yard debris collection programs.

Reuse paper and office supplies.

Save used manila envelopes and file folders for in-house reuse. Establish a convenient collection point to share reusable materials. Donate old letterhead, envelopes and other office supplies to student organizations, primary grade classrooms or the parent-teacher group.

Beg, borrow, share or rent equipment.

Rental shops rent just about any type of equipment. If you frequently need equipment, but cannot afford or justify its purchase, check with neighboring businesses to see if you can set up a sharing or borrowing agreement. In fact, many business are willing to give outdated equipment to schools for continued use when they upgrade equipment to meet their needs.

Janitorial maintenance.

Include janitorial staff in the resource efficiency program from the beginning. Include ideas like reusing plastic garbage can liners in rooms that generate only dry waste, buying bulk cleaning supplies, using plastic refillable spray bottles, and installing cloth towel rolls in the restrooms and lounges instead of paper. Replace toxic cleaning products with less-toxic alternatives.

Don't haul it!

At Rowe Jr. High in the North Clackamas School District, the garbage won't be emptied if the custodian sees any recyclable material in the can!

Recycle What You Can

Recycling is driven by materials and markets. Some areas are able to recycle items because they are closer to markets. Contact your solid waste collector or local recycler to find out what materials are recyclable in your area.

Fire regulations.

Make sure recycling collection, storage, and pick-up plans comply with Fire regulations and codes. Contact your county solid waste office or the State Fire Marshal (see next section).

Storage and collection of recyclables.

The key to creating a successful recycling collection and storage system is to keep it convenient and easy to use. Maintaining flexibility is also important. Use the following checklist to design a workable system:

- ✓ Work with your recycler or garbage hauler to design and set up a system. Call your local city or county for assistance in planning.
- ✓ Involve janitorial and/or maintenance staff and building management.
- ✓ Design the system around your existing garbage collection operations.
- ✓ Consider the space constraints of your premises.
- ✓ Consider the special needs of students and employees with disabilities.

There are numerous recycling container options for schools. Check to see whether your district has already adopted guidelines.

Notes:

Resources

Notes:

City/County/Regional Services

Oregon law requires certain cities and counties (depending on their population) to provide residents with the opportunity to recycle. Check with your county solid waste office (see the Resource Section for phone numbers) for the services available in your area.

Checklist of potential recyclables in your area:

- White/color/scrap paper
- Newspaper
- Magazines
- Corrugated cardboard
- Glass
- Tin cans
- Scrap metal
- Motor oil
- Some plastic
- Milk cartons
- Crayons

Hints to help your recycling program work

- Put recycling containers in all classrooms, workstations and mail rooms, and near all copy centers, vending machines, lunchrooms, etc., for all the materials that your school can recycle.
- Make sure your recycling bins are highly visible and attractive.
- Make sure recycling is picked up often enough that the bins are never overflowing.
- Include signage that tells what is and isn't included in your recycling program.
- Establish a policy that no garbage will be picked up if it contains recyclables (works best in classrooms).
- Decrease the number of trash cans.
- Be sure your program includes education/promotion, and tracking/reporting.

Who Does What?

Finding the right resources can be time-consuming and frustrating. There are virtually thousands of books, videos, curricula, magazines, and other resources available to you. Listed below are some of the best contacts and references you'll need. This listing is not intended to be all-inclusive, and some of the references will lead you to other resources. Involve students in researching the resources available and contacting people for information. Have fun!

Governmental Organizations

There are many organizations involved in various aspects of protecting natural resources. Listed below are some of the organizations that have resources for schools. Begin by calling local agencies and organizations. Your city/county environmental service office, garbage and recycling hauler, and utility provider may have resources to help you. Call them first.

City and County Governments:

City and county governments in Oregon are responsible for the management of solid waste. This means they are in charge of providing waste collection services and adequate disposal options. Many cities and counties provide solid waste and recycling info and presentations.

Baker	(541) 523-2626	Malheur	(541) 889-5719
Benton	(541) 754-0444	Marion	(503) 390-4000
Clackamas	(503) 655-8521	Milton-Freewater	(541) 938-5658
(after 11/1/96)	(503) 557-6363	Morrow	(541) 989-9500
Clatsop (Astoria)	(503) 325-5821	Multnomah (East)	(503) 618-2405
(Seaside)	(503) 738-5717	Polk	(503) 623-9237
(Cannon Beach)	(503) 436-1581	Brandts	(503) 838-0464
Columbia	(503) 397-1501	Dallas	(503) 623-2552
Coos	(541) 396-3121 Ext. 380	Sherman	(541) 442-5410
Crook	(541) 447-5208	Tillamook	(503) 815-3975
Curry	(541) 469-2425	Umatilla	(541) 276-1271
Deschutes	(541) 388-3638		(541) 567-8842
Douglas	(541) 440-4526	Union	(541) 963-5459
Gilliam	(541) 384-6351	Wallowa	(541) 426-3332
Grant	(541) 820-4632	Wasco	(503) 298-5149
Harney	(541) 573-5018		(503) 296-3056
	(541) 573-6553	Washington	(503) 648-8609
Hood River	(541) 386-4676	Wheeler	(541) 468-2689
Jackson	(541) 779-4161		
	(541) 482-1471	Other Recycling Contacts in the Portland	
Jefferson	(541) 475-4459	Metropolitan/Multnomah County Area:	
Josephine	(541) 474-5325	METRO Recycling Info. Center	
	(541) 479-5339		(503) 234-3000
Klamath	(541) 883-4696	METRO Main #	(503) 797-1700
Lake	(541) 947-6004	City of Portland	(503) 823-7772
Lane	(541) 746-3023	Portland Public Schools Environmental	
Lincoln	(541) 265-4171	Services	(503) 331-3449
Linn	(541) 754-0444		

Notes:

Resources

Notes:

Regional Government:

Metro

**600 NE Grand Ave
Portland, OR 97232**

General information:

(503) 797-1700

Recycling Information Center:

(503) 234-3000

Metro is the regional government for Clackamas, Multnomah and Washington counties and is responsible for growth management, transportation and land use planning, solid waste management, regional parks and greenspace programs, and operating the Metro-Washington Park Zoo.

Metro provides speakers, check-out materials, videos, presentations, puppet shows, and curriculum materials on solid waste and recycling for schools in the Portland metropolitan region.

State government agencies:

Oregon Department of Environmental Quality

**811 SW 6th Ave
Portland, OR 97204**

General Information:

(503) 229-5696 or 1(800) 452-4011

Solid Waste

(503) 229-5913

The Department of Environmental Quality (DEQ) is the state agency that administers laws regulating air, water, and land pollution. The agency's authority is delegated by the Environmental Protection Agency to operate Federal environmental programs in the state. This includes Federal Clean Air, Clean Water and the Resource Conservation Recovery Acts. In addition to Federal environmental programs, state statutes are administered for programs including solid waste management, planning and recycling, and environ-

mental cleanup activities.

DEQ has information and curriculum materials for teachers and students on solid and hazardous waste, air (not indoor air), and water. Videos are also available on loan (see More Information).

Oregon Department of Energy 625 Marion Street, Northeast Salem, OR 97310

(503) 378-4040

Responsible for promoting efficient use of energy, they provide information on energy conservation in school and at home, alternative energy sources, and energy auditing.

Oregon Department of Water Resources

**Commerce Bldg.
158 12th St., NE
Salem, OR 97310**

(503)378- 3739

1(800)624-3199

By law, all surface and ground water in Oregon belongs to the public. It is the job of the Water Resource Department to manage Oregon's public water to ensure a sufficient supply to sustain its growing economy, quality of life, and natural heritage. The agency promotes water conservation and coordinates water planning activities with other agencies and citizen groups.

Oregon Department of Education Child Nutrition and Food Distribution Program

**Public Service Building
255 Capitol Street, NE
Salem, OR 97310-0203**

Main #: (503) 378-8004

CNFD #: (503) 378-3310

Inspects and provides technical assistance to school cafeterias.

**The Office of the State Fire Marshal
(503) 378-3473**

Provides information on regulations relating to storage areas and storage containers for recyclable materials.

**Environmental Protection Agency
Region 10 Office
(Alaska, Idaho, Oregon, Washington)
1200 6th Ave
Seattle, WA 98101**

**General Information Hotline
1(800) 424-4372**

The Environmental Protection Agency is charged by Congress to protect our nation's air, water, and land. EPA has hundreds of publications available free to teachers and students on hazardous and solid waste reduction, air, and water protection.

Non-governmental Organizations:

**Association of Oregon Recyclers
PO Box 15279
Portland, OR 97215-0279
(503) 255-5087
Fax: (503) 254-7536**

AOR is a not-for-profit organization of businesses, government agencies and individuals committed to encouraging waste prevention and recycling in Oregon. Each year AOR hosts an Education and Promotion Conference (usually in May), and an Annual Conference. AOR also sponsors the WRAP Award with DEQ (for more information see: Grants and Awards) and provides its members with an excellent monthly newsletter.

**Oregon State Public Interest
Research Group (OSPIRG)
1536 SE 11th Ave
Portland, OR 97214-4701
(503) 231-4181**

Conducts independent research and monitors governmental and corporate actions. Major areas of concern include: pollution prevention, resource conservation, and sustainable energy.

**The Center for Environmental
Education
881 Alma Real Drive, Suite 300
Pacific Palisades, CA 90272
(310) 454-4585**

or e-mail: cee@earthspirit.org

Founded in 1989 by Jayni Chase, CEE is a nationally-based nonprofit environmental education resource center. Its goal is to provide a link between the educational community and the abundant environmental resources available. This organization is an excellent resource. They publish a biannual newsletter packed with great information.

**North American Association for
Environmental Educators (NAAEE)
PO Box 400
Troy, OH 45272
(513) 676-2514**

A network of professionals and students working in the field of environmental education throughout North America and in over 25 countries. The association promotes and supports environmental educators. Members receive the Environmental Communicator.

Notes:

Resources

Notes:

Environmental Education Association of Oregon (EEAO)

**PO Box 4007
Portland, OR 97240
1(800) 322-EEA0**

A professional, non-profit organization dedicated to creating an environmentally literate society. EEAO provides information, resources and educational services to individuals who share a concern for the quality of our natural environment.

Multi-topic Educational Materials:

Blueprint For a Green School

**Jayni Chase/The Center for Environmental Education
Scholastic, Inc.
1(800) 325-6149
\$29.95**

This book is quite possibly the most comprehensive encyclopedia of environmental safety information for schools. Topics covered include: Pesticides, nutrition, cleaning products, energy, water, school gardens, electromagnetic fields. It also includes an extensive bibliography of environmental educational materials, books and videos. This book should be in every school!

Clearing Magazine

**19600 S. Mollala Avenue
Oregon City, OR 97045
(503) 656-0155
or e-mail: clearing@teleport.com
Five issues each year**

An excellent magazine filled with activity ideas, and resources for teaching about the environment in the Pacific Northwest.

Earth Notes for Educators

Grade K-6

EPA

Communications Education and Public Affairs

**401 M Street SE (A-10&)
Washington, DC 20460**

EPA's newsletter for environmental education. Filled with program ideas, award-winning programs and resources.

Environmental Management (EM) Power

Grade 6-12

Idaho Water Resource Research Institute

**106 Morrill Hall, University of Idaho
Moscow, Idaho 83844-3011
(208) 885-6429**

The EM Power curriculum approaches youth skill development using a process approach to guide youth from acquisition of knowledge through application by completing home or community action projects. Includes activities, poster and youth journal.

Generation Earth Video & Companion Manual

Jeff Barrie

Earth Endeavors

PO Box 6130

Torrance, CA 90504

(310) 535-2419

\$39.95 for institutions,

\$25 for individuals

Presents 20 of the most outstanding EE projects across the U.S. Includes "How to" info, ideas on doing projects including environmental audits, outdoor classrooms, water quality monitoring, composting, recycling, etc.

Solid Waste and Recycling:

**Rethinking Recycling
Activity Packet and Teacher Guide
Grades K-12
Department of Environmental
Quality
811 SW 6th Ave
Portland, OR 97204
(503) 229-5913 or 1(800) 452-4011**

Provides 12 age-appropriate lessons for K-12 (in four grade-level groupings) including handouts, transparency masters and a teacher's guide. Activities are hands-on and interdisciplinary. The Teacher's Guide is full of resources and information. It is free to Oregon teachers.

**Cycles for Science
Grades 9-12
Steel Recycling Institute
680 Anderson Drive
Pittsburgh PA 15220-2700
(412) 922-2772**

Excellent curriculum supplements for high school Biology, Chemistry, General/Earth Science, Physics, Community Volunteer Opportunities, Projects.

**Worms Eat Our Garbage: Classroom
Activities for a Better Environment
Grades 4-8 (and up)
Flower Press
100332 Shaver Road
Kalamazoo, Michigan 49002
Mary Appelhof
Mary Frances Fenton
Barbara Loss Harris**

This book integrates earthworm activities with soil science, plant growth studies, and ecological issues. Excellent hand-outs with activities that emphasize scientific methods, observing, recording data, measurement, problem-solving and comprehension.

**Worms Eat My Garbage
Flower Press
10332 Shaver Road
Kalamazoo, Michigan 49002
Mary Appelhof**

Detailed information on setting up and maintaining a worm composting system.

**Wormania (video)
Flowerfield Enterprizes
10332 Shaver Road
Kalamazoo, Michigan
Mary Appelhof**

This 60-minute video will teach you more about worms than you thought possible to know. The camera travels inside a worm bin and shows you what goes on in the dark! Did you know that a worm has five hearts and no teeth? Don't miss this thriller.

Energy Conservation:

**Science Projects in Renewable
Energy and Energy Efficiency
National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, Utah
Phone # (801)539-1406
Fax# (801)539-1451**

Fun lessons packed with information and hands-on opportunities.

**National Energy Education
Development Project
Program Department
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
(801) 539-1406**

Excellent resources including interactive, educational posters and other materials.

Notes:

Resources

Notes:

**Educating Young People about
Energy for Environmental
Stewardship
Environmental Stewardship Program
National 4-H Council
7100 Connecticut Ave
Chevy Chase MD 20815
(301) 961-2913**

A guide to resources for curriculum development with an emphasis on youth-led, community-based learning.

Water Conservation:

**The Stream Scene
Grades 6-12
Oregon Department of Fish and
Wildlife
PO Box 59
Portland, OR 97207
Attn: Stream Scene
(503) 229-5400
\$15**

A comprehensive 300-page curriculum designed to bring watershed awareness into school. Units include the water cycle, watersheds, riparian areas, hydrology and water quality.

**Project WET
Grades K-12
Norie Dimeo-Ediger
(503) 647-2623**

An excellent curriculum. To get the curriculum you must attend a training. Call Norie for more information.

**The Volunteer Monitor
Eleanor Ely
1318 Masonic Ave
San Francisco, CA 94117**

National newsletter of volunteer water quality monitoring. Published twice a year and used by schools and community groups involved in water quality monitoring.

Grants and Awards:

DEQ/AOR WRAP Award Program

Each year, AOR/DEQ presents awards to two schools and an individual or group for creating comprehensive, successful waste reduction programs. Awards of \$100 are presented at the Association of Oregon Recyclers Spring Education and Promotion Conference. For more info, contact the Oregon Department of Environmental Quality at (503) 229-5913, or 1(800) 452-4011 and ask for the Waste Reduction Education Specialist.

Oregon Green Schools Recognition Program

This program was designed to assist, promote, and recognize effective waste reduction programs in schools. Through an application process, schools can get recognition for being a Green School, a Green School with a Certificate of Merit, or a Premier Green School. Each level brings with it a higher level of recognition. To find out more about the program, call the appropriate number:

Clackamas County
(503) 650-3239

Washington County
(503) 648-8609

City of Gresham
(503) 618-2613

Portland Public Schools
(503) 331-3449

Other Multnomah County Schools
(503) 234-3000

Salem-Kaiser School District
(503) 399-5588

Newberg Area
(503) 538-1388

Corvallis
(541) 754-0444

Conversion Guidelines

In general, disposal fees are determined by the size of a dumpster (cubic yardage volume) and the frequency of collection. So when completing your company's waste audit, the following guidelines will be helpful in determining the amount of materials available for recycling.

Conversion

Municipal Solid Waste (uncompacted) cubic yards x .15=	xx tons
One cubic yard=76 cubic meters
One pound=4545 kilograms
One liter=0013 cubic yards
202 gallons=	One cubic yard

Plastics

1- cubic yard whole, loose PET soda bottles	30-40 lbs.
1- 30" x 48" x 62" bale, whole, loose, PET soda bottles	500 lbs.
1- 30" x 48" x 62" bale, film plastic	1,100 lbs.
1- cubic yard HDPE milk jugs, whole, loose	24 lbs.

Glass (average weights)

1- 10 oz. single serving juice container19 lbs.
1- 12 oz. container23 lbs.
1- 20 oz. container38 lbs.
1- 75-gallon caddy filled with glass (uncrushed)	174 lbs.
1- 46-gallon bin filled with glass (uncrushed)	107 lbs.
1- cubic yard glass, whole bottles	600-1,000 lbs.
1- grocery bag, whole bottles	16 lbs.

Aluminum (average weights)

1- 10 oz. single serving container06 lbs.
1- 75-gallon caddy filled with aluminum cans	23 lbs.
1- 46-gallon bin filled with aluminum cans	12 lbs.
1- cubic yard aluminum cans	50-74 lbs.
1- grocery bag, aluminum cans	1.5 lbs.

Steel/Tin

1- 10 oz. food/beverage can16 lbs.
1- 35 oz. food/beverage can33 lbs.
1- 75-gallon caddy filled with steel cans	54 lbs.
1- 46-gallon bin filled with steel cans	33 lbs.

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Fine Paper/Newspaper/Corrugated Cardboard

1- 75-gallon caddy filled with white paper/newspaper	212 lbs.
1- cubic yard white paper	500 lbs.
1- 40-yd. container filled with flattened,corrugated crdbrd	6,000 lbs.
1- cubic yard flattened, corrugated cardboard	150 lbs.
1- cubic yard newspaper	500 lbs.
1- 12" stack, newspaper	35 lbs.

Mixed Metals

1- cubic yard	180 lbs.
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Wood Waste

1- cubic yard pallets	215 lbs.
1- cubic yard sawdust	705 lbs.
1- cubic yard wood scraps	475 lbs.
1- cubic yard comm'l/indust. yard waste, uncompacted	250-450 lbs.

Special Wastes

1- gallon oil	7 lbs.
1- tire, passenger car	12 lbs.
1- tire, truck	60 lbs.

Glossary of Terms

This glossary was taken in part from the Rethinking Recycling Teacher's Guide, Oregon Administrative Rules (Division 90), Away with Waste, and The No Waste Anthology.

acid: chemical substance capable of reacting with and dissolving certain metals to form salts; turning litmus indicators red, or reacting with bases or alkalis to form salts; or having a sour taste.

biodegradable: capable of being broken down into simple substances or basic elements by micro organisms.

caustic: capable of corroding, burning, dissolving, or eating away by chemical action.

caution: warning found on a moderately toxic substance (lethal dose: an ounce to a pint).

clean: remove contaminants and dirt.

composting: use of microbes to break down organic matter into a useful product.

conserve: preserve and protect natural resources from loss or waste.

contamination: process by which something is made impure.

corrosive: chemical agent that reacts with or attacks the surface of a material causing it to deteriorate or wear away.

corrugated: shape in folds or parallel and alternating ridges or grooves, in this case the middle wavy layer of a cardboard box.

danger: warning label for hazardous substances that are extremely toxic (lethal dose is a drop to a teaspoon).

decay: to decompose or rot.

decompose: decay; rot; come apart; change form; break down into simpler components.

degree: one of series of steps or stages in a process or course of action.

disposable: designed to be thrown away after use.

ecomangement: using ecological criteria (relationships between organisms and their environment) to make decisions or choices when planning activities, processes, or purchases.

economic: of or pertaining to the production, development, and management of material wealth.

energy: the capacity to perform work or produce a change from existing conditions.

energy recovery: production of energy in a usable form from mass burning or refuse derived fuel incineration, pyrolysis, or any other means of using heat for combustion of waste.

environment/environmental: all the conditions, circumstances, and influences affecting the development or existence of organisms; of or pertaining to the environment.

environmental management: consciously planning and making choices to preserve or protect the environment and/or its components.

flammable: easily started on fire; capable of burning rapidly.

franchise: business with approval to operate within a limited or restricted territory, in this case geographical boundaries for garbage or recyclables collection.

Notes:

Resources

Notes:

garbage: material considered to have no value and thrown away.

generator: source of production, in this case of waste or recoverable material.

hazardous: substances which cause special problems because they are poisonous, explosive, corrosive of metal or skin, harbor disease-causing microorganisms, are radioactive, or are dangerous for any other reason.

hierarchy: a group of people, ideas, objects, etc., arranged in a graded series (high to low, good to bad, etc.).

ignitable: category of hazardous substances that catch fire readily or explode easily (see also flammable).

incinerate/incineration/incinerator: reduce the volume of solid wastes by use of an enclosed device with controlled flame combustion; the furnace, boiler, kiln, etc., where wastes are burned under controlled conditions.

integrated waste management: an approach to managing waste that includes all methods including reducing waste at the source, reusing materials, recycling and remanufacturing products, recovering energy from incineration of wastes and disposing of any remaining waste, usually in a hierarchical or preferred order.

irritant: hazardous substance that causes soreness or inflammation.

landfill: a disposal facility at which solid waste is placed on or in the land.

leachate: liquid that has percolated through solid waste and/or been generated by decomposition of solid waste — contains dissolved, extracted, or suspended materials. May contaminate ground or surface water, and is especially a problem in areas of high rainfall and porous, sandy-gravelly soil.

lifecycle: the useful lifetime of a resource or product from its initial mining or manufacturing, through usable life, salvage or recycling for use in or as a new product.

litter: waste materials carelessly discarded in an inappropriate place.

manufacturing by-products: waste or leftover resources produced from the manufacture of products (not the intended product).

material recovery facility (MRF): facility designed to remove usable products or resources from the waste stream.

natural resources: a material source of wealth occurring in nature such as timber, fresh water, wildlife or a mineral deposit.

municipal solid waste: waste that is generated by households, businesses and institutions.

NIMBY: acronym for “not in my backyard”; an attitude taken by citizens who want a particular service or function to take place, but not in the immediate vicinity in which they live and/or work.

non-toxic: not poisonous or dangerous to life.

non-renewable: natural materials which, for one reason or another (scarcity, length of time required for formation, rapid depletion rate, etc.) are considered to be finite and exhaustible.

organic waste: material that is living or has been living that the user has determined is no longer useful and has “thrown away” e.g., food, yard debris.

pesticide: any substance used to kill nuisance organisms.

plastic: any of various complex organic compounds produced by polymerization that can be molded, extruded, or cast into various shapes and films or drawn into filaments used as textile fibers.

poison: a substance that causes illness, injury or death, particularly by chemical means.

post-consumer waste: a finished material which would normally be disposed of as solid waste, having completed its life cycle as a consumer item. Post-consumer waste does not include manufacturing waste.

precycle/precycling: making choices prior to purchase to reduce the amount of waste generated from the purchase — includes buying in bulk, buying recyclable packaging, using reusable bags, buying products with little or no packaging, etc.

pre-consumer waste: waste from any manufacturing process, such as paper offcuts from a paper mill.

raw materials: resources in their naturally-occurring, unrefined or unprocessed state.

reactive: hazardous substance that undergoes an unwanted reaction when exposed to other substances.

recyclable: a product made of materials that can be reused as material for new products.

recycle: the collection and reprocessing of manufactured materials for reuse either in the same form or as part of a different product.

reduce: lessen the amount, degree, extent, number or price, in this case, amount of waste.

regulatory agency: government agency with the assignment to enforce regulations passed by legislative process.

remodel: remake with a new structure; reconstruct.

renewable resource: natural resource which can be renewed or regenerated by natural ecological cycles or sound management practices, such as trees and water.

reprocessed materials: materials that have undergone a remanufacturing cycle.

resource: something (or a supply of something) that can be used or drawn upon.

resource assessment: the process of quantifying the amount of materials, energy and water consumed.

reuse: to extend the life of an item by repairing or modifying it or by creating new uses for it, generally in its original form.

risk: possibility of suffering harm or loss; danger.

sanitary landfill: a site designated for the burial of wastes in which the waste is spread out, compacted and covered with a layer of dirt. The site is constructed to reduce hazards to public health and safety, and under federal law must include an impermeable lower liner to block the movement of leachate into ground water, a leachate collection system, gravel layers to control methane, and other features.

source separation: sorting recyclable materials into specific types (such as paper, aluminum, steel, and glass) by the person who last uses the materials before collection for recycling.

Notes:

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source reduction: process of reducing the amount of waste generated at the source of the waste.

stewardship: responsibility for management and use of a resource or place.

toxic: defined for regulatory purposes as containing poison and posing a substantial threat to human health and/or the environment. Harmful, destructive, or deadly. Poisonous.

transfer station: a holding facility for garbage where waste is reloaded into large trucks for more cost-efficient transportation to landfills, recycling dealers and resource recovery sites.

trash: worthless or discarded material; refuse, garbage.

vermiculture: process of using worms and their by-products to produce partially decomposed organic waste material called vermicompost for use as a soil additive and fertilizer.

warning: hazardous substance label for very toxic substances (lethal dose is a teaspoon to a tablespoon).

waste: materials determined to be of no value and thrown away.

waste evaluation: the process of assessing the amount and kinds of waste produced in a given time (also

called a waste audit, a garbage or trash audit).

waste prevention: prevention or elimination of waste prior to generation, including where the product is manufactured, purchased or utilized (consumed). The design, manufacture, acquisition, and reuse of materials so as to reduce the quantity and toxicity of waste produced at the place of origin.

waste stream: all materials being thrown away, including items which could be recycled or burned for energy recovery.

waste reduction: reducing the amount of waste produced by careful buying, less wasteful practices, or reuse of materials.

waste stream composition: components of the waste stream by kind of material (paper, plastic, wood, food, etc.).

waste management: process of dealing with waste.