

What Is Waste Prevention?

New York City's public school system encompasses 66,000 teachers and 1.1 million students in more than 1,100 buildings with a budget of nearly \$9 billion. Private schools also teach tens of thousands of students in facilities throughout the City. Students are in school for six to eight hours a day. During that time, they read, write, calculate, work on computers, create beautiful works of art, perform music and theater, play and exercise, and eat meals. All of these activities offer opportunities to reduce waste and make the learning experience more efficient.

So what is waste prevention in the context of operating a school in New York City? Waste prevention means reviewing and changing those practices that result in wasted supplies, wasted food, and discarded packaging. It means implementing initiatives that eliminate waste including paper and cardboard, food and other organic materials, plastics, and textiles, as well as wasted energy and water. Any wasted resource takes away from valuable resources that could go toward enriching the educational experience for a student.

Schools offer numerous waste prevention opportunities, but they also inherently come with a

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Students at the Brearley School created this display to illustrate what they had learned as a result of the NYC WasteLe\$\$ project.

New York City Schools Share Successes

This past spring, teachers and students from New York City public and private schools came together at a NYC WasteLe\$\$ seminar to discuss how schools can support efforts to reduce the quantity of waste they generate. Increasingly, public and private schools alike are realizing a need to reduce their reliance on the City's waste management services by

reducing the quantity of materials generated by daily activities.

The seminar highlighted several New York City school waste prevention and recycling programs. Each participating school involved faculty, administrators, custodial staff, and students in developing waste reduction and recycling initiatives tailored to best meet the needs of the school.

The Brearley School, a private girls school in Manhattan and a NYC WasteLe\$\$ partner, offered information about incorporating resource conservation lessons into the classroom and curriculum. Laurie Seminara, a science teacher at the school, walked attendees through the school's participation in the NYC WasteLe\$\$ program both figuratively and literally with a presentation and a tour.

According to Seminara, "The Brearley School viewed the goals of the NYC WasteLe\$\$ program as identifying wasteful areas in the school; raising the awareness of students, faculty, and staff by involving them; and then enacting policies that will ultimately result in changes in behavior, in the production of less waste, and in money savings."

By hosting a WasteLe\$\$ week, the Brearley

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Students' Creativity Turns Waste Into Art

Did you ever wonder who could use a pallet load of off-spec belt buckles, 42 reams of mis-printed stationery, 20 cubic yards of foam cones, 20,000 feet of mis-dyed shoelaces, 1,200 used three-ring binders, or pallet upon pallet of discontinued toy parts? Schools in New York City and



Trash becomes treasure in school classrooms and art rooms.

throughout the U.S. are proving that these manufacturer rejects are treasures waiting to be discovered.

In New York City, several organizations, including Materials for the Arts, a program fund-

ed by the Department of Cultural Affairs, the

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Spotlight on Lighting

When Doug Sheppard breaks out his sample products, he is in the spotlight, quite literally. Nothing makes a stronger impression than seeing a new product in action. Sheppard, President of Advanced Energy & Lighting, Inc. in New York City, presented the newest in lighting technologies at a *NYC WasteLe\$\$* seminar for New York City schools. He demonstrated each lamp's light quality and explained the cost and energy savings to be gained by considering different types of lighting.

Sheppard's company, Advanced Energy & Lighting, specializes in delivering energy efficient system designs that are reliable and affordable. He works with individual businesses and organizations to redesign lighting systems, often improving the quality of light, while reducing costs. "Customers are always amazed that they often have more light when the retrofit is complete, but the overall wattage of the fixtures is less," says Sheppard.

Among Sheppard's samples were LED exit signs, several small compact fluorescent lamps, and T-5 and T-8 fluorescent lamps that replace the 8-foot tubes that are standard in many schools. He described the additional benefit with many of the new fixtures is that most manufacturers offer a two-year maintenance warranty on lamps and ballasts.



Doug Sheppard of Advanced Energy & Lighting, Inc., demonstrates several new lighting technologies at a *NYC WasteLe\$\$* seminar.

Many seminar attendees were interested in learning about fixtures that can maintain the desired atmosphere in their schools through lighting techniques. Several fluorescent biax lamps that Sheppard had on hand were available in three colors of light. Sheppard explained that today's full spectrum fluorescent lamps allow you to choose the level of warmth or coolness you would like from the lamp's lighting color.

He also explained that the newer, electronic ballasts have no flicker as older magnetic ballasts once did. This is better for students, especially those with epilepsy, who are affected by flickering light.

Safety is especially important in schools, so LED exit signs are a recommended improvement. LEDs last for five to ten years, reducing the labor costs to change lamps and the worry that a vital sign may be burned out in an emergency situation.

In addition to the nuts and bolts of lamps and fixtures, Sheppard also described studies con-

ducted by the U.S. Department of Energy and the Rocky Mountain Institute that found by improving lighting, workers are more comfortable and more productive. According to the Rocky Mountain Institute, an increase of one percent in productivity can provide savings to a company that exceed its entire energy bill. He offered a report that documents eight cases in which efficient lighting, heating, and cooling have measurably increased worker productivity, decreased absenteeism, and improved the quality of work performed.

For example, Lockheed's engineering development and design facility saved nearly \$500,000 a year on energy bills, gained 15 percent in productivity, and reduced absenteeism by 15 percent by designing daylighting into its new facility. Boeing's retrofitting project in which more than one million square feet of space in the hangar-sized assembly plants received new lighting, reduced its lighting electricity use by up to 90 percent, with a two-year payback period and reduced product defects at the same time.

The Main Post Office in Reno, Nevada, became the most productive of all sorting facilities in the west-

ern U.S., with the lowest error rate for mail sorting, all as an extra benefit of a money-saving lighting retrofit. The facility was redesigned to include a lowered, sloped ceiling in the sorting area and longer-lasting lamps providing a better quality of light. The lower ceiling made the area easier to heat and cool, improved acoustics, and enhanced indirect lighting. Besides combined energy and maintenance savings of about \$50,000 — a six-year payback — the post office estimates that its productivity gains were worth \$400,000 to \$500,000 per year. The six to eight percent increase in productivity gained by providing a quieter, more comfortably lit work environment, paid for the entire renovation in less than one year.

If lighting changes can show these results in business settings, imagine what they can do for students. For more information about increasing productivity through energy efficient design, contact the Rocky Mountain Institute at (970) 927-3851, and ask for *Greening the Building and the Bottom Line*.

For more information about lighting options for New York City schools, contact Doug Sheppard of Advanced Energy & Lighting, Inc. at (212) 589-4313.

Schools Share Successes ▶▶ continued from page 1

School was able to involve all students in some way, inside and outside of the classroom. Each grade completed a task that was related to the curriculum it was currently studying. For example, an upper school chemistry class inventoried all of the cleaning products used in the school and their primary chemical constituents. A biology class conducted a sort of all lunch room leftovers to determine how much of the lunch waste was food waste and how much was packaging materials.

The *WasteLe\$\$* week efforts culminated in an all-school assembly where students presented their findings in creative skits. Seminar attendees the school that students had produced as a result of the *WasteLe\$\$* week activities. Seminar says, "Getting students involved is how you get something accomplished."

Stuyvesant High School teacher, Rich Realmuto, uses recycling and waste prevention as a platform to teach students problem solving skills in his Technology classes. "I enjoy working with students with my own subject matter to teach lessons about conservation and waste reduction," says Realmuto. The issue this year: too much waste paper generated and going to recycling or disposal. Realmuto tasked students to design and produce a 'marketable' commodity using only waste materials as feedstock. Each year, students design and create an innovative new product and this year was no exception. Creative, young engineers and resource managers designed a desktop notepad holder made from molds using pulped paper from the school's recycling bins and sawdust from other Technology class projects.

At the United Nations International School (UNIS), a task force of students, faculty and parents addresses environmental issues. According to Joy Garland, a teacher at the school, UNIS enhances its recycling program by creating a celebratory atmos-

phere where students are awarded badges and by displaying colorful posters, designed to encourage participation, throughout the cafeteria. Classroom recycling is supported by students from Save Today's Endangered Planet, which is the school's environmental club, and concerned faculty throughout the school. UNIS approaches its environmental outreach program by offering unique, entertaining experiences for students.

Environmental Jeopardy

Answer:

UNIS spends this every month for electricity.

Question: What is \$70,000?

Jason McDonald, UNIS's Media Lab Director, enlivened the seminar by demonstrating the "Environmental Jeopardy" computer program he created to encourage upper level commitment to the school's environmental programs. Students, faculty and administrators are challenged to answer questions addressing a host of environmental issues relating to activities within the school, interacting with a lively computer program with colorful visuals and lots of sounds.

The seminar offered schools in New York City an opportunity to share ideas and make important contacts for further discussions about programs. Speakers demonstrated that by creating learning environments where students are engaged in waste prevention activities through hands-on evaluation and measurement strengthens the opportunities for students to work toward building an environmentally responsible school. Students who are challenged to increase their waste prevention knowledge through fun activities and are surrounded by dedicated faculty and administrators will thrive as students and as citizens, passing their knowledge on to others.

Don't Forget School Laboratories

When it comes to identifying and replacing potentially harmful products, you may think of cleaning and maintenance activities, but don't forget to investigate your science labs, photo labs, and art rooms. Each of these areas uses numerous chemicals and substances that can be toxic to students, faculty, and staff through inhalation, ingestion, or direct contact. Some of the chemicals can be replaced or eliminated, but others may be necessary. For these, consider ways to improve how you store, use, manage, and dispose of the chemicals.

In 1995, President Clinton announced the "Green Chemistry Challenge" as one of his Reinventing Environmental Regulations Initiatives. The Green Chemistry Challenge was established to promote pollution prevention and industrial ecology through a new U.S. Environmental Protection Agency Design-for-the-Environment partnership with the chemical industry. Schools are joining small businesses, industry and government in demonstrating a commitment to designing, developing, and implementing green chemistry methodologies that are less hazardous to human health and the environment. Here are a few tips to help make your labs and classrooms less wasteful and safer for students and faculty.

- **Initiate microscale laboratory practices.** Microscale chemistry reduces the quantity of waste generated at the source by carrying out chemical processes and experiments using reduced quantities of chemicals. In addition to reducing the quantity of chemicals purchased and used to conduct experiments, students will benefit from improved air quality and limited exposure to chemicals.



Low shelves with shelf labels, and proper labeling of all chemicals reduces accidents in chemistry labs.

According to experts, laboratory methods, glassware, and chemical analytical techniques all must be modified to carry out chemical operations on this scale. For example, in microscale chemistry, the amounts of chemicals used are reduced from the traditional 10 to 50 g for solids or 100 to 500 mL for liquids to 25 to 100 mg for solids and 100 to 2000 mL for liquids. Converting to microscale chemistry also will reduce purchase and disposal costs for chemicals.

- **Improve the purchasing and inventory control of laboratory chemicals.** Purchasing chemicals in small quantities reduces the quantity of unused chemicals that remains at the end of an experiment or at the end of the school year that must be effectively managed. By creating and maintaining a database of all chemicals in labs and classrooms, you can keep track of what is available in the school and what needs to be purchased. As chemicals are used or disposed, the list can be updated, providing an accurate inventory throughout your school. The list also can include data on the intended use of the chemical, a description of the storage practice for each chemical, and any storage and handling safety information. Software for creating a database is available from chemical supply companies.

- **Improve the labeling of chemicals.** All chemicals in the laboratory and in the classrooms must be properly labeled. Proper identification prevents the dangerous mixing of chemicals and provides for ease of identification for disposal for expired chemicals. Chemicals that are divided into smaller containers, for use by students conducting experiments, should be properly labeled. A label should contain as much information as possible, including the chemical or compound name, hazard class, quantity and date generated, date purchased and/or expiration date. The label also should include any handling and safety infor-

mation. Labels should be created using an indelible marker. Preprinted labels specifically for this purpose are often available through chemical supply companies. Waste management costs can increase significantly if a certified hazardous waste disposal vendor must handle and dispose of an unidentified chemical.

- **Store chemicals properly.** Storage is a key component in using chemicals effectively. Storing chemicals in a central location tends to reduce waste, while decentralized storage can result in surplus chemicals.

All materials should be stored in closed cabinets or on low shelves, and all tops and lids should be securely in place to avoid spills and evaporation. In addition, certain chemicals have specific storage requirements. Poisonous chemicals and corrosives need to be stored in a separate, locked cabinet. Flammable chemicals should be stored in a fireproof cabinet. Chemistry and biology chemicals should be stored separately, and acids and bases should be stored separately.

- **Post safety information about hazardous materials in science and photo labs.** Laboratory safety charts are available from major scientific supply companies. Ensure that all safety equipment is in place and functioning. This includes eye wash stations and showers, fire extinguishers, sinks, and exhaust hoods. This equipment should not be blocked and should be no more than 25 feet away from anyone working in a lab.

- **Institute a program to recover silver from the photo lab.** Schools in New York City are regulated by the New York City Best Management Practices to Control Silver Discharges program. These silver controls, adopted in 1995, are based on best management practices identified to achieve a given percentage removal of silver from wastewater prior to discharge. Daily use of a school's photo development lab generates recoverable silver in photoprocessing solutions, spent rinsewater, scrap film and scrap printing paper.

According to a U.S. EPA Guide to Pollution Prevention, "As much as 80 percent of the total silver processed for black-and-white positives and almost 100 percent of the silver processed in color work will end up in the fixer or bleach-fix solution. Silver also is present in the rinse water following the fixer or bleach-fix due to carry-over." Contact your chemical supply company for information about equipment available for silver recovery.

- **Arrange for regularly scheduled pickups of hazardous waste.** Often, chemicals can become more reactive, toxic or unstable over time and should be removed before they pose a significant threat. Hazardous waste collection can be costly, but it is money well spent when you consider that the alternatives may be storing the product indefinitely or discharging the chemical down the drain or in the trash. All of these alternatives to proper management can have unwanted outcomes. Proper purchasing, storage, labeling, and use of chemicals in your labs and classrooms can minimize the costs associated with hazardous waste disposal as well as minimizing the potential adverse effects of the chemicals and the associated liability.

For a list of licensed hazardous waste transporters and for answers to questions regarding proper disposal of hazardous waste from schools, contact the New York State Department of Environmental Conservation at (718) 482-4995. ■

The Brearley School's Waste Prevention Week Activities by Grade

Lower School: Collected and weighed white and mixed paper separated for recycling.

Grade 5: Completed a lighting survey of all fixtures in the building.

Grade 7: Collected and weighed aluminum cans and plastic bottles separated for recycling.

Grade 8: Analyzed school electric bills to quantify costs of heating and lighting.

Biology Classes: Measured organic and inorganic cafeteria wastes.

Chemistry Classes: Conducted a survey of all cleaning products used in the school.

Physics Classes: Analyzed the lighting survey to determine energy use and costs.

Brearley Environmental Action Committee (the upper school student environmental club): Compiled and reported on the data collected by their peers.



FOR MORE INFORMATION:

- The Brearley School
Laurie Seminara
(212) 744-8582
- Stuyvesant High School
Rich Realmuto
(212) 312-4800 ext.1939
- United Nations International School
Joy Garland or Jason McDonald
(212) 684-7400 ■

How Do We Begin? Guidance for

*Let us remember in our deliberations,
the effect our decisions will have on the next seven generations.*

— *Invocation for Iroquois Tribal Council*

School administrators, principals, faculty, and parents alike would probably agree that protecting the environment and conserving valuable resources is important for any institution tasked with instilling a sense of responsibility in our Nation's children. Including this ethic in the multitude of challenges our schools face requires visionary leaders capable of motivating those around them to find innovative solutions to reducing reliance on wasteful products and practices.

These visionary leaders can serve as the catalyst, encouraging other staff and faculty members to identify new operating practices and purchasing policies that serve to reduce the quantity of materials and waste associated with myriad school activities. In addition, teachers can be encouraged to view their mission from a new perspective. Teaching students to weigh the environmental impacts of their decisions and choices through classroom experiences provides a powerful opportunity to make a difference.

The first steps to designing a waste prevention program may be the most difficult. Finding time to incorporate additional responsibilities may be burdensome, but the benefit of enhancing a student's environmental awareness and the opportunity to conserve valuable school resources will outweigh the challenges. Begin enhancing your school's environmental awareness and waste prevention program by considering the following steps.

- **Issue an environmental mission statement.** Create a policy statement issued by the principal that conveys the objective of institutionalizing waste prevention practices and behaviors into the school's standard operating practices.

- **Establish a waste prevention and recycling committee.** Identify representatives from all sectors within the school, including administrators, custodians, food service staff, teachers, students and parents to serve on the waste prevention and recycling committee. The committee coordinator should be an individual who has a good understanding of the many facets of waste prevention and school operations, and who is capable of evaluating and reporting on the progress of the waste prevention program.

- **Review your school's operations and activities.** Conduct waste assessments of all operational areas and school activities. Look at what is purchased, how it is stored, how it is used, and how it is discarded. Identify the major waste generating activities and areas.

- **Identify cost-effective, feasible waste preventing opportunities.** Review the findings of your waste assessment. Ask staff, students, and faculty if there are ways that these waste generating activities could be altered or eliminated. You may find there are several ideas for reducing each waste stream. Some may be behavioral changes, while others may involve changes in technologies and equipment. Determine what changes are feasible and will reduce costs in your school.

- **Develop a waste prevention and recycling plan.** Develop a plan based on the results of reviewing and analyzing school operations and activities. Choose the most effective recommendations and develop a timeline and a matrix of responsibility to ensure that each recommendation is implemented. The plan can recommend waste preventing changes to practices and procedures and methods for measuring the results.

- **Communicate findings to staff and students.** Share the appropriate information with all relevant parties in the school. Communicating program details, information about new procedures, and success stories helps to ensure full, continuous participation of everyone. This can involve training and instructions, as well as general information about positive changes in the school.

- **Implement a waste prevention program.** Begin implementing the new programs and making the selected changes within the school. Ensure that all key representatives are aware of the new practices and have an opportunity to provide constructive feedback on the impact of the implemented program.

- **Evaluate performance and provide feedback.** Revisit each of the recommended changes and new programs to determine if the initiative is reducing the waste stream, if there are any unpredicted impacts to other operational areas of the school, and to determine if the change is reducing costs. Programs require maintenance and adjustments to be successful. Provide feedback to the committee, school management, and keep students in the feedback loop where appropriate. This should include positive feedback, such as praise and awards, as well as suggestions for improving the programs. For students, waste prevention and conservation achievements can be celebrated at every turn; through school assembly programs, in school publications, at after-school events, and in the classrooms.

Opportunity is the Key

Below are some specific waste prevention ideas that may be appropriate in your school. Use them as a starting point for your own creative ideas and programs.

Grasscycling — Leave It on the Lawn

For schools with lawns, custodians can reduce the amount of waste that is bagged and set out for removal from the school by leaving grass clippings on the lawn to naturally degrade. Leaving grass clippings on the lawn is a healthy way to return nutrients and moisture to the soil, reducing the need to apply fertilizers and pesticides. Grass also can be used as mulch around plants and shrubs, and can be composted with leaves and other yard waste.

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Students can be encouraged to bring lunches to school in reusable containers instead of disposable paper or plastic bags. Children are quick to pass this message along to parents.

lot of support and motivation for making changes. Getting the students involved in these kinds of campaigns makes all the difference in the world.

In many cases, waste can be eliminated by using durable items, or reusable products rather than disposables. If you work with your cafeteria staff, it

can mean minimizing waste through new approaches such as offering menu selections that enable students to select smaller portions, or alternative side dishes that do not compromise the nutritional value of a meal. Waste also can be prevented by changing ordering schedules to minimize spoilage, or teaming up with a

food bank for daily pick-up of edible, leftover food.

Regardless of the size or type of the school you are in, there are new ways of doing your job in a "less wasteful" way. Keep in mind, waste prevention is as much about what you buy as it is about what you throw away. It also is about when you buy, and how you use what you buy. Keep an eye on what fills your dumpsters each day or over a week, and ask yourself if *and how* that wasted material could have been prevented.

Essentially, waste prevention is inventorying the waste in your school and taking deliberate steps to eliminate it. In this issue of *NYC WasteLe\$\$*, we present strategies and success stories of waste prevention, as well as highlights from an *NYC WasteLe\$\$* seminar featuring waste prevention, recycling, and energy conservation initiatives. For more information about these topics, visit www.nycwasteless.com. Preventing waste saves money, saves time, and conserves resources. It makes good sense and sends a positive message to future generations. ■

Starting a Waste Prevention Program

The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired in value.

— **Theodore Roosevelt**

Composting

For schools that generate yard waste, composting can be an exciting science class or environmental club activity. Some food waste (e.g., fruits and vegetables) also can be composted.

Although composting requires the cooperation of custodial staff and some monitoring, it need not result in much additional work for school custodians. It can even reduce some labor time since composting eliminates the need to bag and set out compostable waste for removal from the school. Creativity can help overcome some of the challenges of composting. For example, Stuyvesant High School in Manhattan established a composting bin on its rooftop to overcome a lack of space.

Reducing the Toxicity of Custodial Supplies

Reducing the toxicity of cleaning and maintenance supplies is an important waste prevention goal. Some chemicals found in building maintenance supplies can be hazardous to human health or the environment. Common products that may contain hazardous constituents include paints, adhesives, carpet cleaners, pesticides, and thermometers. When discarded, these products may be regulated hazardous wastes. Improper disposal of these items can result in regulatory violations and liability exposure for the school. (See *Toxicity Reduction Prevents Waste* and *Don't Forget School Laboratories* in this issue for more information about reducing toxics.)

Reducing Food-related Waste

Disposables, such as plastic containers, bags, plates, cups, utensils and trays, often are part of school food service operations. These disposables not only waste natural resources and cost the City money to collect and dispose, they also may cost the school more to purchase than purchasing and using reusable items. While in the beginning it may be expensive to install a new dishwashing and durable dishware system, in the long run more cost savings may be realized with a switch to a dishwasher and durable/washable food service items.

Many schools do not have the responsibility of determining how kitchens will

operate, and making a switch to durable serviceware becomes a long-term objective that will require extensive interaction with the Board of Education and other key leaders. For schools that have the opportunity to make a transition to less wasteful materials, perform an analysis of the cost of disposables versus the long-term savings available from using durables, and the cost-effectiveness of the switch will become apparent.

School Purchasing Guidelines

Incorporating waste prevention objectives into purchasing guidelines can decrease the amount of waste generated, encourage better use of supplies, and save money. Purchasing for waste prevention includes buying more durable goods that may be more expensive in the short-term but will save money in the long run.

Although public schools have only limited purchasing discretion when purchasing items from a requirements contract, schools have discretion when buying items directly from vendors. To promote waste prevention through procurement, schools can develop a set of criteria for evaluating products already on requirements contracts, and can apply them to items that they are allowed to purchase independently of the Board of Education's Office of Purchasing Management.

Private schools have much more flexibility when making purchasing decisions although they also must justify purchases within the management systems in place at each individual school.

As schools prepare for the next academic year, administrators and teachers may want to consider incorporating a waste prevention and enhanced recycling program into the plans that will take the students into the next millennium. These suggestions may be part of a more comprehensive plan for your school or they may serve as a starting point.

Students, faculty, and staff who keep the school performing at the highest standards will benefit by the increased efficiencies that will result from a successful waste prevention program. ■

For Public Schools

The following list includes items that promote waste prevention and may currently be on the Board of Education's Office of Purchasing Management requirements contracts:

- Duplex printers
- Duplex copiers
- Durable dishes and trays
- Mechanical pencils and refillable pens
- Roll paper towels and electric hand dryers
- Bulk dispensers for beverages and condiments
- Reusable air filters
- Long-life, energy efficient, compact fluorescent bulbs
- Cedar blocks instead of mothballs
- Less hazardous cleaning products
- Rechargeable alkaline batteries
- Water-based correction fluid
- Refurbished printer toner cartridges
- Appointment book refills

The school can bid for or initiate a bidding process for the following items that may not currently be on contract with the Board of Education:

- Chlorine-free paper
- Soy-based inks
- Mulching lawn mowers
- Two-way envelopes
- Cartridgeless printers



FOR MORE INFORMATION:

New York City Department of Sanitation
To order *Mandatory Recycling in Schools* and *Urban Home Composting Guide*, call the Sanitation Action Center at (212) 219-8090 or download them from DOS' Web site at www.ci.nyc.ny.us/strongest

Council on the Environment of New York City
(212) 788-7900

New York City Board of Education
Recycling & Solid Waste Management Program
(718) 391-6458

Open Road
(212) 260-9658
Provides teacher workshops on composting; on-site help with project set-up; and student intern training.

Brooklyn Botanical Garden
Urban Compost Project
(718) 622-4433

Green Guerrillas
Manhattan Compost Project
(212) 674-2816

New York Botanical Garden
Bronx Green-up Compost Project
(718) 817-8543

Queens Botanical Garden
Queens Greening Compost Project
(718) 539-5296

Staten Island Botanical Garden
Compost Project Assistance
(718) 273-0629

NOTE:
See the "Recycling Resources" article in the *NYC WasteLeSS* Recycling issue for more information about resources and curriculum pertaining to waste prevention.

School Case Studies

Students in New York City schools have made efforts to reduce waste and conserve energy. They are going beyond classroom work and sharing their knowledge with fellow students, their families and their communities. Here are just a few of the efforts undertaken in the City:

- Environmental Science students at Samuel Gompers High School in the Bronx organized a series of energy projects, including initiating lighting conservation in their school, writing letters and producing radio public service announcements to educate citizens about methods of conserving energy, building demonstration solar collectors, and creating art and music to sensitize fellow students to the significance of conservation.
- Earth Science students at DeWitt Clinton High School in the Bronx took waste reduction ideas home to try to reduce the quantity of waste generated in their homes. This effort, which is part of an overall project to protect the NY/NJ Harbor Estuary, included preparing an educational campaign to educate citizens about the benefits of waste reduction.
- Science students from I.S. 318 in Brooklyn conducted a school energy audit and organized a town meeting in the school to share results with other students.
- Eighth grade students at J.H.S. 126 in Manhattan initiated a paper reuse project called Project Obliterate Waste (POW). Students collected white office paper from bins placed in all offices, then sorted out the paper that has only been used on one side. With this paper, the students made bound notepads, which included waste prevention shopping tips on the inside covers, and distributed the notepads at school events.
- Eighth grade science students at St. Stanislaus Kostka conducted a school energy audit and hosted an energy fair for fellow students.

Toxicity Reduction Prevents Waste

Some cleaning products commonly used to disinfect restrooms, wax floors, and clean windows can pose health hazards to staff, faculty, and students, as well as to those who handle your waste after it is removed. Paints and paint thinners also can contain harmful substances. When compared to traditional products, environmentally preferable cleaning and maintenance products have a reduced impact on human health and the environment.

Take a close look at the products used in your daily operations to identify opportunities to consider testing and switching to alternative products. Look on your shelves, review the material safety data sheets (MSDSs), and talk to custodians and teachers. You may be surprised at what you find. For example, a review of your current products may reveal that the restroom cleaners contain ammonia.



Low-VOC paints, which reduce air pollution and the risk of worker exposure, are available from several major manufacturers.

Is Your Staff Informed?

Material safety data sheets (MSDSs) are mandatory information sheets that accompany all potentially toxic products and materials. The Occupational Safety and Health Administration (OSHA) requires that MSDSs be readily available to all staff using or handling the materials. Each MSDS contains pertinent information about the material's or product's ingredients, its harmful characteristics, and how to respond to spills, accidental contact, and other exposure. An MSDS can provide life-saving information, as well as data about using the product safely and most effectively.

These products can be replaced by alternatives that offer the same performance standards. For example, the Enviro Solutions company produces a washroom cleaner with envirocide odor eliminator for daily cleaning of sinks, showers, and urinals. Don't

stop after you look at the more obvious heavy-duty cleaners. Look also, for example, at the dish soap used in the teachers' lounge or the paint used to touch up hallways and classrooms.

When considering switching to a reduced-toxicity cleaner, check the labels of your current products to see whether they contain any of the chemicals listed in the adjoining box, *Targeting Toxics*. This list is not comprehensive, but includes some of the more common, toxic chemicals found in cleaning products.

TARGETING TOXICS

Common Toxic Chemicals Found in Cleaning and Maintenance Products Targeted by the U.S. EPA for Reduction or Elimination

Acetone	Aluminum oxide
Ammonia	Benzene
Carbon Tetrachloride	Chloroform
Ethyl benzene	1,2-Dichloroethane
Ethylene glycol	Freon 113
Glycol ethers	Hydrochloric acid
Lye	Methyl ethyl ketone
Methyl isobutyl ketone	Methanol
Methylene chloride	Naphtha
Phenol	Sodium hydroxide
Sulfuric acid	Tetrachloroethylene
Toluene	Trichloroethylene
1,1,1-trichloroethane	Xylene

When environmentally preferable products were first introduced, as with any new product, some were not as effective as the products they were meant to replace. However, based on approximately thirty years of research, many environmentally preferable cleaning and maintenance products now meet all of the same standards as traditional products. In addition, most vendors will ship samples so that you can test the effectiveness of the product before making a purchasing decision.

While you may not be able to find environmentally preferable cleaning and maintenance supplies for all your needs, alternatives to traditional cleaning supplies are available. Everyday new products are introduced to the market that have eliminated constituents of concern such as 1,1,1-trichloroethane, toluene, and methyl ethyl ketone.

Consider the following benefits of using environmentally preferable cleaning and maintenance products:

- May be less expensive than traditional supplies.
- May help reduce worker exposure to harmful chemicals, reduce the number of sick days taken by workers, increase worker productivity, reduce workers' compensation claims, and improve compliance with OSHA regulations.
- May reduce the quantity of toxins going down your drain, which may help you to comply with wastewater treatment permit requirements.
- May help to reduce customer exposure to certain chemicals, thus reducing the potential for adverse reactions.

Green Seal, an independent, nonprofit organization that promotes the manufacture and sale of environmentally responsible consumer products, sets environmental standards and awards a "Green Seal of Approval" to products that cause less harm to the environment than other similar products.

Green Seal-recommended 'green cleaners' must satisfy the following criteria: non-toxic to humans and aquatic life; pass specific aquatic toxicity tests; phosphate and phosphonate concentrations must be less than 0.5% by weight; biodegradable; work optimally when diluted with cold water; and packaged as a concentrate in recyclable/refillable containers with post-consumer recycled content. For more information, visit Green Seal's web site at www.greenseal.org, or call (202) 872-6400

Environmental Attributes To Consider When Selecting Cleaning and Maintenance Products:

- Irritation potential
- Chronic health risks
- Time to ultimate biodegradation
- Bioconcentration factor
- Percentage of volatile organic compounds
- Presence of ozone depleters
- Potential exposure to the concentrated cleaning solution
- Flammability
- Presence of cosmetic additives
- Energy needs
- Amount of product packaging

Source: Cleaning Products Pilot Project, U.S. EPA, 1997

Many web sites highlight environmentally preferable cleaning supplies, with product descriptions and information on the environmentally preferable substitute for particular hazardous chemicals.



Defense Logistics Agency
www.dscr.dla.mil/products/epa/epocat.htm
 Although the DLA site was designed for military customers, its information is valuable and accessible to the commercial sector, as well. You can request a hard copy of the list of product substitutes by calling (800) 345-6333.

Joint Service Pollution Prevention Technical Library
<http://enviro.nfesc.navy.mil/p2library>
 This site offers anyone information about less toxic alternative products and services.

New York State Department of Environmental Conservation, Pollution Prevention Unit
Environmental Compliance and Pollution Prevention Guide for Small Quantity Generators
www.dec.state.ny.us
 This guide offers a straightforward summary of regulations for air, water, and hazardous waste. Call (800) 462-6553 or visit their web site.

U.S. General Services Administration
Commercial Cleaning Supplies
 This catalog lists hundreds of commercially available, environmentally preferable cleaning supplies. Call (800) 241-7246. ■

FEEDBACK... Tell Us What's On Your Mind. We would like to hear from you. Please take a few minutes to let us know: (1) if you find the information provided in *NYC WasteLeSS* useful, (2) what waste prevention, recycling, and energy efficiency topics you would like to learn more about, and (3) any other thoughts and comments, including your own waste prevention, recycling, and energy conservation success stories. Simply write to us at *NYC WasteLeSS*, NYC Department of Sanitation, 44 Beaver Street, 6th Floor, New York, NY 10004, or you may fax information and comments to us at (212) 837-8255 (attention: *NYC WasteLeSS*). Thank you for your input.



The New York State Aquarium installed EConights™ recycled rubber flooring (Photo courtesy of Dodge-Regupol, Inc.).

Waste Prevention in Your Office

Look around your school's administrative offices. Do opportunities to reduce waste exist? Administrative functions are the backbone of the school and anything you can do to make them more efficient will benefit the entire school.

Implementing innovative waste prevention programs in your administrative operations — beyond common initiatives, such as double-sided copying and using reusable coffee mugs — may require coordination among staff and with suppliers. However, implementing waste preventing practices beyond the basics will result in savings through reduced purchasing costs. Consider the following opportunities when developing a waste prevention plan that meets the needs of staff in all your school offices. Whether your school is public or private may affect your ability to implement some of these recommendations, but every school has the ability to make some changes and improvements.

- **Lease furniture and equipment.** Leasing furniture for your offices, rather than purchasing and discarding items every few years, reduces the significant cost of disposing of bulk items. Leasing also reduces the cost of acquiring updated equipment on a regular basis. Ever-changing technologies make it more efficient to lease equipment, such as photocopiers, printers, and fax machines, rather than discarding old models to get the newest features in a new model. Public schools should check with the Board of Education to determine if any furniture or equipment contracts involve leasing programs.
- **Repair or donate existing furniture and equipment.** If your offices need a facelift, consider refurbishing and recovering existing furniture or donating used furniture and equipment to a non-profit organization or to other schools as an alternative to discarding it. Public schools have the opportunity to "shop" for free furniture and equipment at the Department of Citywide Administrative Services (DCAS) Surplus Warehouse. If equipment is outdated, several companies in New York City can help you to keep your computer system updated and your office equipment running properly. ACE Computer Repair, at (212) 869-0988, will repair and upgrade your computers, as well as repair faxes, copiers, typewriters, and other office equipment. Lincoln Business Machines, Inc. ((212) 769-0606) will repair and upgrade your computer system, and also installs and rents computers. MacVision ((212) 586-8445) specializes in

MacIntosh computer equipment repairs and upgrades.

- **Get off mailing lists.** Request to be removed from mailing lists to eliminate unwanted advertising mail by contacting:
Direct Marketing Association
Mail Preferences Service (MPS)
P.O. Box 9008
Farmingdale, NY 11735-9008

Or visit the Association's web site at www.the-dma.org to obtain an electronic form requesting to be removed from mailing lists.

Remember, not all companies use MPS to purge their mailing lists; therefore, you may continue to receive some companies' promotions. In this instance, contact the company directly and ask to be placed on the company's do-not-mail list. For more ways to reduce business junk mail, visit the National Waste Prevention Coalition's web site at www.metrokc.gov/nwpc/.

- **Buy products in the largest quantity for the job.** Purchasing office supplies in the largest quantity that you can use cuts down on packaging waste, and your waste stream. Consider consolidating purchases so that you are getting larger shipments once a month, quarterly, or at the beginning of each semester or school year instead of smaller ones daily or weekly. If your supplier is delivering single items in larger shipping boxes, request that they wait until they have your full order ready before sending the shipment. You can help your supplier by coordinating your orders so that you are requesting multiple items for each shipment. This will reduce the amount of transport packaging, such as cardboard, plastic film, and strapping, that must be managed or discarded.
- **Reuse packaging.** Consider reusing scrap paper, packing materials, pallets, bags, and boxes for shipping out materials or offer them to teachers for classroom projects. Collecting shipping materials and reusing them eliminates any disposal costs, and eliminates the purchase of new materials, such as plastic bubble wrap, new pallets, and cardboard boxes.
- **Make your school environmentally smart.** If you are considering any refurbishing, remodeling or construction projects, or if you just want

to learn about the newest, most innovative efficient building materials and practices, contact Eco Smart Healthy Properties, LLC, in Manhattan. Eco Smart's Building Center showcases environmentally and technologically advanced building and office products, such as furniture, textiles, lighting, and carpeting, by more than 300 manufacturers. Contact them at (212) 430-4000.

- **Survey your vendors.** Your vendors and suppliers may be more willing than you think to make changes. They also may have some creative and practical ideas about reducing waste. Call them or distribute a simple survey asking for their ideas and gauging their willingness to make changes and improvements to the distribution system already in place. You may be able to work with them to reduce or take back packaging for reuse, use reusable shipping containers, or pursue other initiatives that save money for both of you.
- **Go paperless.** Schools have made tremendous progress in reducing the quantity of paper necessary to function successfully. Supplies can be ordered and delivered using electronic ordering systems instead of paper forms and invoices. Linking terminals using a network system allows everyone to view the same documents within the school. E-mail memos can eliminate paper memos and students can even receive e-mail messages in computer labs. Consider these and other paperless strategies in your school to cut down on paper purchasing costs and storage needs.
- **Buy recycled.** Ask your suppliers to provide you with a list of all of the items they carry that have recycled content. Paper products, desk accessories, trash and recycling bins, restroom dividers, floor mats, furniture, and laser toner cartridges all are widely available at competitive prices with recycled content. (See *Advances Continue in the Recycled Product Market* in the Recycling issue of *NYC WasteLeSS* for more about recycled products.) If you purchase from the Board of Education, request available items that contain recycled material. In addition, your voice can help to increase the number of items available through the Board of Education that contain recycled materials. If a recycled-content item is not available, request that it be made available. ■

Students Turn Waste Into Art continued from page 1

Department of Sanitation, and the Board of Education, facilitate interactions between scrap generators and those who will gladly use scrap for creative projects. Materials for the Arts is a service for the cultural community that finds new uses for materials that would otherwise become waste. According to Susan Glass, Director of Materials for the Arts, during FY 99, approximately 514 tons of materials were donated by businesses, organizations and individuals in the City. These items are valued at more than \$3 million, according to Glass.

Materials for the Arts transfers the items to New York City-based, non-profit, cultural organizations; health, social and community service organizations; public schools; and City agencies. Materials for the Arts currently is expanding its operations. The Project ARTS Schools program is entering its final phase this school year, offering access to the ware-

house to all 1,100 public schools in the City. Beginning this fall, public school faculty can schedule an appointment to visit the warehouse if they teach at a "registered" school. Principals in all public schools have received a registration package, so check with your principal to ensure that your school is registered.

Materials for the Arts, is just one of almost 50 similar organizations across the country, as well as in Canada, Great Britain, Italy, and the Bahamas. Two international and national service organizations, Global Reusable Resources Association and ReDO (Reuse Development Organization, Inc.) help promote and establish school-based reuse of manufacturers' discards. The concept has taken root and continues to evolve to serve the materials requirements of budding scholars, artists, and engineers throughout local schools, scout troops, youth programs, and art studios, as well as the waste reduction needs of numerous businesses.



FOR MORE INFORMATION:

Materials for the Arts

410 West 16 Street
New York, NY 10011
(212) 255-5924
fax (212) 924-1925

www.ci.nyc.ny.us/html/dcla/html/mfa.html



Lorraine Graves, an Environmental Specialist with the U.S. Environmental Protection Agency, Region II, explains the benefits of the WasteWise program at a NYC WasteLe\$\$ seminar.

Joining EPA's WasteWise Program

The U.S. Environmental Protection Agency's WasteWise program can provide a framework for your waste prevention program and other waste reduction efforts. WasteWise is a free, voluntary partnership program that encourages organizations to reduce waste through waste prevention, recycling, and buying or manufacturing products with recycled content. WasteWise provides partners with technical assistance, publications, and public recognition opportunities. WasteWise partners saved an estimated

\$26 million in avoided disposal costs in 1997, and avoided paper purchasing costs for all the program's partners in 1997 could be as high as \$60 million, according to the Fourth Year WasteWise Progress Report, published by U.S. EPA in September 1998.

For more information, visit the WasteWise Web site at www.epa.gov/wastewise or call the WasteWise helpline at (800) 372-9473 for a free information packet. ■

Bulk Rate
U.S. Postage
PAID
Brooklyn, NY
Permit #2189

NYC WasteLe\$\$ Program
P.O. Box 156
Bowling Green Station
New York, NY 10274-0156