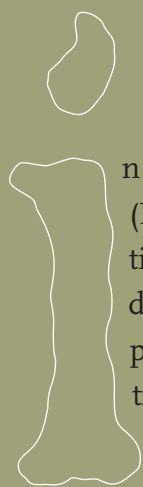


the **greening** of
independent schools



THE
living machine

IMPLEMENTING SUSTAINABILITY



In the mid-1990s, when Darrow School (New York) had to replace an aging septic system, the leadership of the school decided to meet this environmental problem with an environmental solution. In 1998, with financial support from two foundations and alumni and friends, the school built the Living Machine, a constructed ecological system that treats wastewater. Since then, the Living Machine has naturally purified 7,000 gallons of the school's wastewater per day. The school's Samson Environmental Center, where the Living Machine is housed, now receives over 400 curious visitors a year. The project's planners did not want just to solve the problem of wastewater treatment on campus; they wanted a solution that simultaneously moved the school's mission forward, enriched the community, *and* purified wastewater.



AND

beyond

AT DARROW SCHOOL

● BY STACEY GIORDANO

The Living Machine and the Samson Environmental Center are the most visible embodiments of Darrow School's commitment to sustainability, but they only tell part of the story.

Darrow School is a college preparatory boarding high school for approximately 130 students (equal numbers of girls and boys) and is located on the New York side of the Berkshire Mountains. The campus is on the grounds of the first Shaker settlement in North America, and we live and go to school in the buildings the Shakers built nearly 200 years ago.

CORBIS

Education for sustainability requires a shift in thinking from a simplified model of resource consumption toward an integrated view of global natural, social, and economic resources.

The Shaker legacy of simplicity, community, and hard work continue to shape the school's values today. Darrow, while taking its college-preparatory mission seriously, has a strong commitment to instilling a sense of responsibility for one's self and for the role one plays in a community and, thus, seeks to instill an environmental consciousness in the community of life-long learners. The implementation of the environmental directive pervades every aspect of the school and is guided by a common three-pronged sustainability paradigm that presents society, the environment, and the economy as three points on a triangle. Students use this model to make decisions about their relationship to economic, social, and environmental resources. And the model is integrated throughout the entire curriculum — academic, residential, and co-curricular.

All faculty members work to implement sustainability into their curricula guided by departmental chairpersons and the director of studies. In addition, the three faculty members on the Samson Environmental Center team support the work of implementing sustainability throughout the Darrow experience. This team meets weekly to plan school-wide events, such as Earth Day and hosting the Hudson River Basin Clean Water Congress, as well as to conduct in-school professional development workshops on integrating sustainability into classes and running a "greener living on campus" initiative. Outside of this team, many faculty members have responsibilities beyond their classes in areas such as composting campus food waste and residences and recycling paper, metal, glass, and plastic.

Viewing all of this as a process enables us to set goals, but also to avoid complacency when we reach them, or dis-

couragement when the going gets tough. For instance, the SEC team wanted to address the issue of the energy required to run the air blowers in the Living Machine. We applied for and received a grant, along with 49 other schools in New York State, from the state's Energy Research and Development Authority for the installation of a 2-kW photovoltaic array on the roof of the Samson Environmental Center. While this small array offsets the energy coming from the power grid, it is a very small contribution to the overall energy requirement of the Living Machine. Still, it allows us to teach about alternative energy generation, and through the affiliated program, *Solar Power... Naturally*, it

links us to a community of other schools doing the same thing. If we measured the success of this project by the amount of electrical cost savings, we might be disappointed. But measured by the yardstick of sustainability, we see solar power as an environmentally sound, non-



Shaker Second Meeting House, currently the Darrow Library.

polluting source of energy that will eventually pay for itself.

Darrow also understands that raising consciousness takes time and requires repeated exposure to opportunities that allow for ideas to be challenged and re-formed. Education for sustainability requires a shift in thinking from a simplified model of resource consumption toward an integrated view of global natural, social, and economic resources. Students first need to learn how to think about levels of complexities in problems. Then they have to practice trying out some of their solutions. Finally, they need time to reflect on what they have learned in order to integrate their new understandings into their thinking.



Clearly this would not happen for a student who encountered sustainability only in the context of environmentalism, nor would it happen if sustainability were covered in one class or even one discipline. It would be too easy for a student to reach the conclusion that sustainability was merely a science idea or solely a political notion. The teaching of sustainability must be integrated into all aspects of an educational community in order to allow students the opportunity to grapple with this way of seeing the world.

At Darrow, we work hard to achieve that integration. Sustainability looks different depending on where in the school community it occurs: the academic program, the residential program, or the co-curricular program. Each of these areas contributes substantially to education for sustainability. In this manner, sustainability is part of everyday living and learning.

The Academic Program

While sustainability shows up in all classes in all departments, it does not appear the same in each of these venues. Some departments integrate sustainability directly and focus on its environmental application, while other classes explore it in a political, economic, or social context. Some classes look at global issues, while others consider local issues. The combination of views offers students and teachers the opportunity to make sustainability real and sensible.

For example, the science department and the modern language department offer very different opportunities for students to engage the idea of sustainability. In the science department, the integration of sustainability is most directly environmental. In fact, in order to better integrate sustainability, the three yearlong core departmental course offerings are organized so that first-year students take a physical-science-based environmental science course followed by an environmentally based chemistry course and then one in molecular biology. A variety of senior science electives allow further environmental investigations, as well as a physics elective that culminates in planning, building, and racing a model solar car.

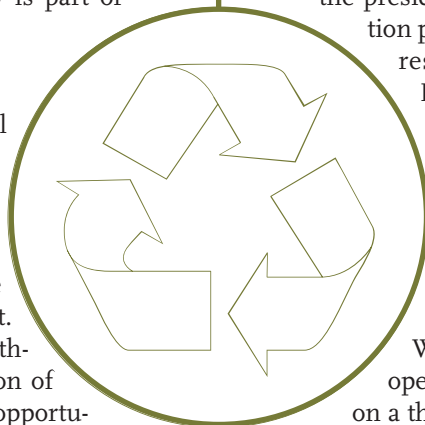
In the modern language department, sustainability is presented as developing cultural understandings. The very act of learning another language is a sustainable action because at its best, it involves understanding another culture. Making this connection explicit for language students is a departmental objective, which is met in a number of ways. Some of the vocabulary assignments and country explorations are environmental in nature — such as in researching a country's commitment to clean energy production, or organic farming practices — but the deeper engagement with sustainability comes when students understand enough of the target language to be able to begin to view the culture through that language. For example, in French III, students watch a documentary about the assassination of

the president of Congo. Students then write a position paper in French about whom they think was responsible for the assassination. Isabel

Ezrati, the French teacher (and leader of the school's composting efforts), said, "This assignment gets students thinking in French. After students have written the paper, they realize they probably couldn't have done it in English. When they start thinking in French, they are ready to start to understand what it means to be French.

When that happens, it is as if the world opens up for them." This assignment builds on a theme begun in French I of exploring where and why French is spoken around the world. An in-depth conversation about colonialism follows and students are on their way to thinking about other cultures with more informed perspectives.

The math, art, English, history, and ESL departments all integrate sustainability as well. Math students work with data gathered in the Living Machine and do efficiency studies between greener energy technologies and fossil-fuel based energy technologies. The geometry class explores the relationship between surface area and electrical production in our photovoltaic panels. English students routinely examine landscape and environment, both social and political, as more than just quiet settings for novels. What makes this education for sustainability is that students are contin-



ually asked to examine the extent to which the experiences they are reading about are dependent upon the environment in which they occur. This helps students realize how the environment shapes people and events.

History students explicitly ask the question, “Why are groups of people living where they are living, and how are these societies sustainable?” Students draw connections between a society’s use of resources and its longevity. In a course on political economy, seniors are given social, economic, and natural resource parameters for a fictitious nation and are asked to build a sustainable society. First-year students in multicultural studies conduct comparison studies of different countries’ uses of environmental resources. Students recently discussed the water wars in Brazil. They worked to understand how access to clean water is not guaranteed in many parts of the world and can even be something people die for.

Art students use the Living Machine plants as molds for clay pots and use the views of the Berkshire Mountains as a landscape subject. Photography students have documented the kinds of plants in the Living Machine, the effects of the change of seasons on the plants, and the wastewater process. An art history class studied how the Hudson River School artists were influenced by their surroundings. Then the class traveled around the Hudson River watershed making paintings. Even the art building — the Joline Arts Center — reveals our commitment to sustainability. Each of the art rooms employs a process to reduce waste. The ceramics studio reuses clay, and the students are involved in rewetting, shaping, and drying the slabs. Painters make extensive use of palettes in order to not

waste pigment, and a watercolor class experimented with a reusable paper-like material made from recycled milk cartons, instead of watercolor paper, to develop their skills.

Students who come to the United States for high school and who are not yet fluent in English are in Darrow’s English as a Second Language program for at least one year. In each of their ESL classes, the students often learn environmental vocabulary as they learn about the various aspects of life at the school. They learn composting, recycling, and writing on one-side-good paper. Further, in the Living Machine, we hang a flag from each of the nations of students we have at the school, as well as a flag of the planet Earth. This is a

symbol that we are a diverse, global community working together toward sustainability.



The Residential Program

Darrow is a boarding school and students spend more time outside of classes than they do in classes. As such, we have an opportunity to live in the dormitories the sustainability we talk about in the classroom. The residential curriculum addresses issues

of healthy living and community membership — integral ideas in the social aspect of sustainability — in both grade-level weekly meetings and school-wide on a semester basis. These activities reinforce the idea that individuals need to make healthy choices in order to be good community members.

We also have systems in the dormitories that reinforce our dedication to the environment. Each dorm recycles glass, metal, paper, and cardboard and gathers soda cans for redemption programs. The results of a campus-wide survey on water- and electrical-use were used to make signs that



are posted in bathrooms, hallways, and computer rooms around campus. Some signs posted in bathrooms, for example, remind people to turn off the water when brushing their teeth. Still others remind us that all wastewater goes to the Living Machine so we need to be mindful about what goes down sinks and drains. The goal is to help people think about the concept of “away.”¹ We want our community to realize that there is no “away.” We need to decide if it goes to the compost bin or the recycle bins or to the Living Machine. As a last resort, it goes to the landfill, but we need to be mindful about what we throw “away.”

The Co-Curricular Program

When students are not in classes or in the dorms, they are most likely engaged in the co-curricular program. This program includes the sports teams, theater productions, student government, student leadership, community service work crews, a week-long experiential program in the spring, and student clubs. All of these areas incorporate sustainability, either as a concept or in the manner in which they use resources. Two of the offerings — the weekly community-service-based Hands-to-Work (HTW) program and the seven-day experiential program called Spring Term — afford students the opportunity to directly apply what they have learned in classes and in the dorms to a real-life experience.

The Hands-to-Work program has its roots in the Shaker philosophy of “hands to work, hearts to God.” Each Wednesday morning, for nearly three hours, students and teachers are organized in small work crews. Each of the 20 or so crews has a specific area of responsibility, on or off campus, and each works together for a trimester.

Some of the crews contribute directly to the environmental mission of the school. The Living Machine crew prunes the plants in each of the tanks, conducts weekly chemical and biological tests, and maintains the meters and pumps. They have even been filmed by the US Department of Energy for a video on green schools. Composting and re-

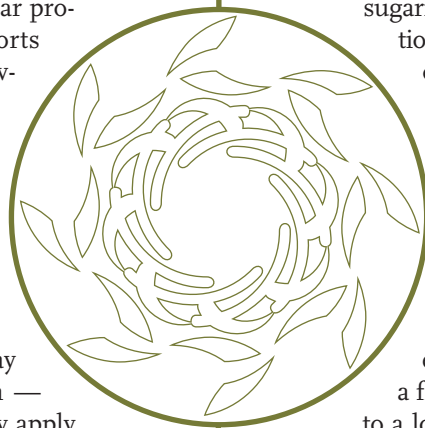
cycling crews manage and maintain these important campus-wide programs. The recycling crew collects soda cans and donates the proceeds to the Pittsfield, Massachusetts Shriners, who help families who need assistance paying for medical bills. The compost is used on our campus vegetable gardens and flowerbeds.

Some of the crews sustain a part of the community that would not exist without their work, and provide for applied learning opportunities. For example, there is a stand of maple trees on campus that is tapped each spring to collect sap to produce maple syrup. There are connections between this HTW crew assignment and a senior-level science class on land use management that makes recommendations for the management of the forest. The Hands-to-Work maple sugaring crew then implements the recommenda-

tions. This past year, the sugaring crew put up over 100 gallons of maple syrup that is used in the dining hall, contributed to local organizations for pancake breakfast fund-raisers, and is sold on Parents’ Weekend.

Similarly, the anatomy and physiology class studies the reproductive cycle of sheep and makes management recommendations to the sheep HTW crew. That crew raises lambs each year that are either donated to a family that wants to start a flock, or are slaughtered and the meat given to a local food bank. This was modeled after the global program Heifer Project International.

Past Spring Term offerings also included going to the United States-Mexico border and working with a group that helps Mexican families in that region. Students live with a host family in Mexico and work with both immigrant families and US border officials. Through this experience, they gain a perspective on the complex environmental, economic, and social issues surrounding illegal immigration. An offering closer to home explores sustainable agriculture in the Berkshires. Students visit and work on organic and low-input produce farms as well as free-range, grass-based livestock farms. They talk with farmers and visit The State University of New York at Cobleskill, a nearby college that has adopted sustainability as a campus-wide initiative.



the greening of independent schools

A perennial favorite Spring Term is a hike to the headwaters of the Hudson River in the Adirondack Mountains. Students gain an appreciation for wilderness and develop confidence in their own abilities to “survive” for a week in the woods. The change in these students, some of whom never spent an overnight outside before, is remarkable.

The Process Continues

There have been bumps in the road to fully implementing sustainability. For instance, one of the very things that make us Darrow, our Shaker legacy, also makes us incredibly energy inefficient. Two-hundred-year-old Shaker buildings make for a great logo, but with many windows and little or no insulation, they are not green buildings. Because they are also National Historical Landmarks, we can do little to make these buildings more energy efficient. Yet, we are not deterred by this

seemingly contradictory situation. We embrace the dichotomy of living in drafty old buildings while preaching energy efficiency. We share with our students the complexity of our real world and ask, “Do we bulldoze these buildings in the name of sustainability? Would we be the same school if we did not live and work in these pieces of history?” The answer to both is, “Of course not.”

And then we ask, “What can we do, given the limitations and opportunities of our community, to live as sustainable a lifestyle as possible?” This is the question we want students to ask all of their lives.

Stacey Giordano is the assistant director of studies and the co-director of the Samson Environmental Center at Darrow School (New York).

¹ From NAIS 2004 Annual Conference in a talk on sustainability entitled, “Revolution in the 21st Century: Re-thinking a Conceptual Framework to Sustain the Planet.” William McDonough. March 4, 2004. Montreal, Canada.

THEATRE CONSULTANTS



S E R V I N G I N D E P E N D E N T S C H O O L S S I N C E 1 9 7 2



Help Them Pay Tuition Online

Help your families

- ◆ Set up tuition payments online
- ◆ Pay tuition in full online

Simplify your life

- ◆ Eliminate paperwork in your office
- ◆ No complex programming



Customize your Web services

- ◆ Turnkey setup and operation
- ◆ No charge to your school

To view a demonstration, go to www.factsmgt.com/ecash. We offer you The Better Way to manage your tuition collection.

