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### Great Green Schools

By P. W. McRandle  
*Issue 136 - May/June 2006*

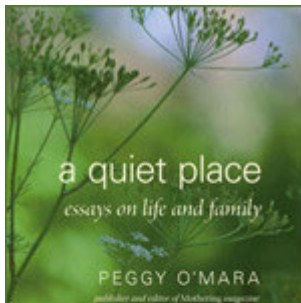
In August 2005, we at The Green Guide—a bimonthly magazine for environmentally aware consumers that provides green home tips, eco-product reviews, and advice for healthy living—published our first annual list of America's Top Ten Green Schools.

We weren't talking about schools that were painted green, as one puzzled administrator wondered, but wanted to recognize those schools that have gone the furthest toward building a better environment for their students and teaching children how to be more conscious of the natural world. While conserving energy, using recycled materials, and planting native species are all valuable in their own rights, the green schools movement also focuses on creating schools in which students can perform to the best of their abilities—by, for example, increasing daylight in classrooms and reducing asthma-triggering volatile organic compounds (VOCs), such as ammonia and formaldehyde.

### High-performance Schools

Eight-year-old Kai Nedd has asthma and lives in New York City's Harlem, where asthma rates are among the highest in the country. She attends the Children's Storefront School, where she learns about organic foods and healthier cooking oils, but she has to be careful at recess time. "She can play outside but can't be around dirt and dust, which kick up her allergies," says her mother, Elaine Nedd. So Kai can't join in mucking about in the organic garden behind the school, a feature that helped make Storefront a runner-up in the Top Ten Green Schools list. Last fall, Storefront implemented an asthma program, working with parents and helping teachers recognize symptoms of asthma attacks. This is essential in a neighborhood where, no matter how clean the school, diesel fumes and construction dust can trigger attacks.

Each year, US children miss a total of 14 million days of school due to asthma attacks.<sup>1</sup> In 1995, the US General Accounting Office reported that almost a fifth (19 percent) of American schools reported unsatisfactory or very unsatisfactory indoor air quality.<sup>2</sup> A problem in itself, indoor-air pollution poses life-threatening risks to asthmatic children, whose numbers rose from the 1960s through the 1990s. Though there's some evidence of a recent leveling off, currently about 6.<sup>3</sup> million American children suffer from asthma, according to the Environmental Protection Agency (EPA).<sup>3</sup> The Centers for Disease Control (CDC) report that asthma is the most common chronic childhood illness<sup>4</sup> and a leading cause of disability among children, while, in 1994, direct healthcare costs for children's treatment amounted to more than \$3 billion annually.<sup>5</sup> It seems that every parent either has a child with asthma or



**a quiet place**  
A new book  
by Peggy O'Mara





knows one.

Schools didn't cause the rise in asthma rates, but anything they can do to remove irritants, such as molds, chemicals in cleaning agents, and volatile organic compounds released by paints or new construction, can help reduce the frequency of attacks and raise the number of days children can attend school. And it's not just about asthma. "Indoor-air quality has a very real effect on how well, or how poorly, kids learn," Claire Barnett, executive director of Healthy Schools Network, told The Green Guide. One bright sign is that, in August 2005, New York State passed legislation that will require schools to use "green cleaners," banning those that give off fumes that irritate children's airways.<sup>6</sup> Though various cities and schools have adopted green cleaning, New York is the first state to legislate it, owing to the efforts of the Healthy Schools Network Environmental Advocates of New York, and New York State United Teachers, among other groups.

Another means of improving air quality and ridding schools of neurotoxic and carcinogenic pesticides is the use of integrated pest management, the first step of which is "depriving pests of food, water, and entryway," says Mark Miller, MD, MPH, director of the Pediatric Environmental Health Specialty Unit at the University of California, San Francisco. One way schools do this is by planting hardier native plants rather than species that require herbicides and synthetic fertilizers, a tactic taken up by Punahou School's Case Middle School, in Honolulu, and other schools on our list. But Punahou School goes even further.

"Rocky Hill, a native Hawaiian plant nursery on campus, is maintained by students and the science department," says Laurel Bowers Husain, director of communication at Punahou. "This nursery grows plants that are unique to Hawaii and gives them to community groups in an effort to bring native plants back to our landscape." Creating such opportunities for students to engage not only with the environment but also with their communities is one of the hallmarks of a great green school. And as for the success of integrated pest management, 14 states now require such programs, and five more recommend it.<sup>7</sup>



Even the simplest-sounding changes, such as increasing the amount of daylight in school classrooms, can have significant results. In a 1999 study conducted in Seattle, Washington, and Fort Collins, Colorado, students in classrooms with the most daylighting were found to have 7 to 18 percent higher test scores than those in classrooms with the least daylighting. More dramatic results were found in a school in Capistrano, California, where, in one year, classes with the most daylight progressed 20 percent faster on math tests and 26 percent faster on reading tests than those with the least daylight.<sup>8</sup> Particularly when combined with reducing noise and increasing air quality, daylighting can be very effective.

Happily, many concerns about indoor air quality and daylighting, as well as other green concerns, such as energy and materials consumption, are addressed by the Leadership in Energy and Environmental Design (LEED) standards of the US Green Building Council (see sidebar, "Green Schools Criteria"). LEED-certified buildings must demonstrate green construction practices and use specific building materials, with higher-scoring projects securing Silver or Gold status.

But the LEED criteria alone are not sufficient to judge a green school. The Green Guide also looked for such obvious means of improving student health and performance as providing more nutritious school lunches, along with green educational programs and other initiatives.



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### The List

No school is perfect, but those listed below (in alphabetical order) not only broadly addressed The Green Guide's criteria, but had special programs that made them stand out above the rest.

#### Case Middle School at Punahou School, Honolulu, Hawaii

Middle school can be a dismal experience, but you might envy the kids at Case, which is part of the private Punahou School (K-12). With nine new buildings that open onto

carefully preserved banyan and monkeypod trees and are being considered for LEED Gold status, Case Middle School offers a truly outdoor education. The parents get it, says Melissa Benjamin, mother of seventh-grader Emma and her older sister Nathalie (who spent half of eighth grade at Case). "The reason buildings were designed this way was that they were modeled after ways children learn best. More spaces allow children to meet and work together, talk to their teachers, socialize together." Photovoltaic cells and an ice plant that creates ice for air-conditioning during off-peak hours have helped lower energy bills by 40 percent. But other features attract the kids.

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"When they opened the building, the motion sensors in the rooms, the [recycled] rubber floors, the recycled-milk-container lockers, and the waterless urinals were always big conversation makers," says Benjamin. The long-term goal, however, is to instill in children a sense of sustaining Hawaii's delicate environment through field trips and learning about native plants, such as tending taro in an off-site program. And the lessons stick: While driving with her mom by the Ala Wai Canal, Nathalie Benjamin cried out, "Look, there are the plants that we planted to help clean up the canal!"

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#### **Clackamas High School, Clackamas, Oregon**

The 2002 construction of Clackamas High School, which replaced a dimly lit, narrow-halled building, was itself an environmental feat. Plants were catalogued, removed, and replanted; hard surfaces were strategically placed to avoid damaging nearby wetlands; and a swale was created to filter and reduce stormwater headed for the wetlands. The new building, certified LEED Silver, includes such energy-saving features as convection ventilation, concrete blocks to provide thermal mass to keep temperatures stable, and admitting enough sunlight to reduce energy use by 44 percent. "We had rooms in our [old] building that had no windows," says biology teacher Andrew Gilford. "Most of the day now, lights aren't on." Using integrated pest management, unpainted surfaces, and ventilating with outdoor air helps keep the indoor air clean. And with the wide hallways and open student meeting areas, Gilford notes, "You don't get that tenseness of a dark, musty high school like you did at the old school."

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As part of the curriculum, students and teachers monitor wetlands, checking on the health of sensitive amphibians and looking for changes in water quality. Fifteen weekends of each year, students are out planting trees, removing invasive species such as blackberry brambles, protecting their watershed, and taking other environmental actions that help make Clackamas High tops, both as a green building and as an environmental asset to its community.

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#### **Clearview Elementary School, Hanover, Pennsylvania**

Completed in 2002 and built on a vacant lot next to the old school without disturbing a single tree, Clearview Elementary received LEED Gold certification for having reduced water use with drought-resistant native plants, waterless urinals, and low-flow faucets, and for saving energy with a ground-source heat pump, daylighting, and triple-glazed windows. Efficient ventilation and the use of non-solvent-based adhesives, paints low in volatile organic compounds such as benzene and kerosene, and green cleaning products—as well as ensuring that no school bus idles its engine out front—all mean that Clearview's air is fit to breathe.

#### **Goodwillie Environmental School, Ada, Michigan**

Starting each day with a 15-minute walk to school through native prairie, Goodwillie's fifth- and sixth-graders arrive bright and already engaged in their classroom, which includes monitoring seasonal changes in the plant, bird, and insect life of their school's environs. You won't find air-conditioning in this LEED-certified building; the geothermal heat that warms its infloor radiant system has earned it a ranking in the 90th percentile of the EPA's Energy Star system of rating energy efficiency. Because children study outside on patios throughout the day, the indoor temperature is kept closer to the outdoor temperature to avoid shock and to create further energy

savings. All that outdoor air, along with low- and no-VOC finishes and simple concrete and wood surfaces, keep down allergens and irritants. The result: parents passed bond issues to build three more schools to the same high standards.

**John M. Langston High School Continuation and Langston-Brown Community Center, Arlington, Virginia**

With uncommon foresight, the community members who participated in the design of this LEED Silver school demanded an area for the recharging of electric vehicles. This might have been inspiration enough for the Head-Start, kindergarten, and high-school students who attend, but the builders also used low-VOC paints, sealants, and adhesives; employed waterless urinals and low-flow faucets; built a system to reclaim rooftop rainwater; and used daylighting and solar shading to ensure the wasting of as little energy, water, and air as possible.

Lick-Wilmerding High School, San Francisco, California ([www.lwhs.org](http://www.lwhs.org)) "Lick-Wilmerding was my children's first choice," says Charlotte Read, mother of Alex (a senior) and Samantha (a sophomore). Green issues were a real draw for her children, she says, who grew up in an environmentally conscious household. Head, heart, and hands are emphasized at this shops-oriented private college-preparatory school, where students apply creative problem-solving skills to create handmade objects ranging from robots to jewelry to wooden tables—all made from sustainable materials. Like many students at this 110-year-old school, Alex and Samantha arrive by mass transit, eat healthy food in the school's cafeteria, and enjoy the open spaces. Students access readouts from the photovoltaic cells on the roof; work with plantation-grown wood; limit the use of oil-based finishes, stains, and paints; learn how to recycle; and use recycled materials in shop classes. The building has natural linoleum floors, recycled carpet tiles, and uses earth insulation and high-fly-ash concrete. (The last, a mix of concrete and the waste from coal-fired power plants, results in reduced carbon-dioxide pollution.) With good mechanical ventilation in shop areas, a ban on pesticides both indoors and outdoors, and the use of green cleaners, students can breathe easily.

**Michael E. Capuano Early Childhood Center, Somerville, Massachusetts**

Sited in a dense, urban neighborhood, this new LEED-registered building borders on a public park and community garden, allowing kids a chance to get their hands dirty planting flowers before returning to the recycled-tire mats of their play areas. But long before the children arrived, 11,160 tons of soil contaminated with PCBs, mercury, and lead were dug up from the building site and removed. Too young to appreciate the 41-percent energy savings over code from the school's enhanced HVAC system and the solar panels on its roof, the kids enjoy the school's Healthy Eating Program and breathe better because of regulations prohibiting the idling of cars and buses. Capuano School also has such child-friendly features as counters, toilets, and windows set to youngster height, and skylights and light shelves that enhance the low-glare daylighting and the learning environment. In the works is a website that will show students how much energy they use in their own classrooms and explain energy consumption and photovoltaic production in terms they can grasp.

**Sonoji Sakai Intermediate School, Bainbridge Island, Washington**

Raising coho salmon hatchlings for release in the on-campus stream is one way students at Sonoji Sakai Intermediate find their places in the world. This five-year-old school brings its fifth- and sixth-graders to campus in a bus fleet retrofitted with particulate collectors to keep students from breathing harmful exhaust—and in fall, every Friday is Bike to School Day. Once there, students gather data on local birds, test groundwater, and study nearby wetlands. Christina Rapada, mother of 11-year-old ReAnna, says of the emphasis on studying nature, particularly salmon, that "culturally it was important for us because the family is related in part to the Nooksack tribe [north of Seattle] and the Squamish Nation and Stolo Nation in Canada." School ties with the local Squamish Tribe (related to the Suquamish Nation) resulted in their participation with and partial funding of the school's salmon-release program. The building's award-winning design ensured that the nearby wetlands wouldn't be starved for water, and a swale and a limited number of impervious surfaces prevent the stream from silting up. Recycled materials with low-VOC finishes

and oversize ducts that reduce mold growth keep the indoor air fresh without relying on an energy-intensive air-conditioning system, and a program of integrated pest management eliminates the use of pesticides. Says Laura O'Mara of her daughters Katie and Jilli, who attended the school, "It spurred on their interest in environmental issues" to the point that "Jilli helped get a little grant to help build a salmon-viewing station at Sakai."

### **Third Creek Elementary School, Statesville, North Carolina**

With classroom gardens for students, trails by a nearby creek and woodland, and native plants, all in a pesticide-free, water-efficient landscape, LEED Gold-certified Third Creek Elementary offers students the best of its natural and human-made environments. Low-flow toilets, metered faucets, waterless urinals, and the lack of an irrigation system have reduced water consumption by more than 30 percent beyond the requirements of the Energy Policy Act of 1992. Low-VOC paints, CO2 monitors, and ventilators keep the air fresh and free of irritants. Third Creek's Winners Circle program provides low-calorie, low-fat lunches to encourage healthy eating at an early age. Add extra insulation, daylighting, occupancy sensors on lights, and efficient water-source heat pumps to lower the energy burden, and you have a high-performing building for high-performing students.

### **Willow School, Gladstone, New Jersey**

"We planted 70,000 native grass and native New Jersey perennial plants around our building," says Mark Biedron, cofounder of the private Willow School, LEED Gold-certified, and he doubtless knows them all by name. Biedron cares deeply for his school, making sure that only four cleaning products, all green, are used, that the ductwork came sealed in plastic, and that it was flushed for two weeks when no one was at school to ensure that it was free of mold and mildew. The building reflects Biedron's environmental concerns, with small windows that expose the insulation of recycled denim and wall plaques noting that the wood used in the windows came from pickle barrels. From recycled steel for the roof to UV-treated rooftop rainwater for flushing toilets, Willow School is a lesson in the use of sustainable materials. That extends to effluents from human waste, which end up digested by plants in a constructed wastewater wetland.

### **Runners-Up**

For successful green building efforts, The Green Guide recognizes New York City's **Calhoun School** for its runoff-reducing green roof, the groundwater-cooled **Dalles Middle School** in Oregon, and **IslandWood School** on Bainbridge Island, Washington, for its "living machine" greenhouse for treating wastewater.

For recognizing and acting on the vital importance of proper nutrition, The Green Guide recognizes the organic- and local-food lunch programs at the Calhoun School and the **Ross School** of East Hampton, New York. Also runners-up are **Martin Luther King Jr. Middle School** of Berkeley, California, where students harvest and prepare organic food; and the **Children's Storefront School** in Harlem, New York City, for its garden, farmers-market tours, and lessons from local chefs.

There's change afoot. We hope our list will encourage other school administrations, parents, and teachers to consider making such changes and to try to get on our next Top Ten Green Schools list. The editors of The Green Guide were pleased to hear from Beth Collins, the chef at Ross School, who said that she used our article "**Sustaining Learning in Green Schools**" as a checklist to encourage the Ross School to adopt green cleaners and other environmentally friendly practices. If we can have that kind of effect on other schools, we'll have achieved all we wanted with this effort.

### **NOTES**

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