



Extreme Makeover: Green Schools Edition

The Green Schoolhouse Series will make gifts of state-of-the-art, multimillion-dollar green schools to underserved districts, all with the help of volunteers and corporate sponsors.

ARE YOU READY for my joke?" asks Jeff Zotara, cofounder of the Green Schoolhouse Series. "Not only are we preserving Earth's natural resources by building green schools, but we're also preserving green frogs."

Maybe it's not a zinger, but Zotara's one-liner perfectly illustrates the relationship between technology and the environment that he hopes to nurture with his latest project. That would be the Green Schoolhouse Series, whereby Zotara—with the help of corporate sponsors and volunteers—hopes to build and donate high-tech, state-of-the-art sustainable schools to low-income districts that qualify for Title I funding.

The green frogs he's referring to are those that will be spared thanks to a Lawrence Berkeley National Laboratory virtual frog dissection program that can be used on the Smart Board interactive whiteboards that will equip the green schools' classrooms. Smart Technologies is one of dozens of sponsors making the Green Schoolhouse Series possible.

Much like the popular (now canceled) television show *Extreme Makeover: Home Edition*, in which homes were renovated for needy families via donated materials from big-name

corporations like Sears, and with the help of labor from local construction companies and thousands of volunteers, Green Schoolhouse Series schools will be funded entirely by corporate partnerships, in-kind donations, and charitable contributions.

The school district and local community will collaborate on each school as well, along with the education nonprofit Brighten A Life that Zotara runs with his father Marshall and their public relations firm Cause and Effect Evolutions.

The school campus—which can take up to two years to plan, may involve as many as 80 partners, and will actually be constructed in just 30 days by a team of 750 volunteers—will be the pinnacle of 21st century green learning. Built to LEED-Platinum status criteria (the highest designation awarded by the US Green Building Council), each design features a laundry list of eco-friendly features: recycled and locally sourced materials, Forest Stewardship Council-certified wood, ultra-efficient insulation, waterless plumbing fixtures, paint without volatile organic compounds—even sustainable door hardware. There are xeriscaped gardens, a rainwater harvesting system, and sleek water bottle refilling stations.

Every school, too, is built with nontoxic materials and designed to maximize natural daylight and ventilation, which not only reduces energy costs but has been shown to benefit students' health and learning. (See the accompanying sidebar, "Green Schools: Student Health and Performance.")

Then, of course, there's the green technology: solar panels and water heaters, Energy Star appliances, an energy management system, motion sensors to conserve energy, and, in some schools, a color-coded lighting system that will provide direct feedback as to how the school is performing.

The highlight of it all? A STEM (science, technology, engineering, and math) classroom that will accompany every 6,000- to 15,000-square-foot Green Schoolhouse, complete with laptops, the aforementioned interactive whiteboards, AV equipment

from Extron Electronics, an audio amplification system, and modular furniture that will support students' collaborative, project-based learning.

Interestingly, while some of the corporate sponsors are ones you might traditionally associate with the "green" movement—clean tech powerhouse Mitsubishi Electric, for instance, or solar-panel manufacturer Empire Renewable Energy—many, like Cisco and Kraft Foods, are not.

“Without science, technology, engineering, and mathematics, there would be no green movement. Furthering our youth’s education ensures that we can be equipped to address environmental concerns.”

—Craig Jacob, president, DeVry University Phoenix Metro Area

Kraft and IGA, for example, are supplying a schoolhouse kitchen for the prototype, **Roadrunner Elementary School** in Phoenix, the first of the Green Schoolhouse series, which is undergoing renovation and expansion in anticipation of opening as a brand new campus in the fall.

What all the companies have in common though, says Zotara, is a stake in America's future workforce, which will have to be educated for high-tech, green-tech 21st century jobs. “Our scientists and engineers are moving into the future, but we've fallen behind on a national scale,” he says, citing the 2009 Programme for International Student Assessment, which ranked US students 17th for science literacy among 34 industrialized nations and 25th for math.

Craig Jacob, president of DeVry University's Phoenix metro area, echoes that sentiment. (DeVry is sponsoring the STEM classrooms at Roadrunner Elementary as well as those at **Orangewood School**, another Green Schoolhouse recipient in Phoenix's **Washington Elementary School District**, where the expansion of an existing campus is under way.) “Without science, technology, engineering, and mathematics, there would be no green movement,” he says. “Furthering our youth’s education in STEM fields ensures that we can be sufficiently equipped to address environmental concerns today and in the future.”

STEM and Sustainability

For the Washington school district, addressing those environmental concerns was a core focus even before it became the beneficiary of the inaugural Green Schoolhouses. Four years ago, the district decided to embark on an aggressive energy conservation and sustainability program.

The first two years of the program focused solely on changing energy behavior—reminding students and teachers to turn

in electricity costs. In the third year, the district continued its behavior program and retrofitted its lighting, saving another \$2 million. “The total cost to create this project was 50 percent of my salary plus the cost of the lighting retrofits—and I only work 20 hours a week and consult with other school districts the rest of the time,” says Sue Pierce, director of the Washington school district's facility planning and energy department.

off the lights when they left the classroom, shutting down computers, and closing the door when the air conditioning was on so hot air wouldn't seep in.

In a district with just over 25,000 students, the effect was cumulative, not to mention impressive: a \$2 million savings

So when the opportunity to apply for the Green Schoolhouse project arose, “it was a natural fit,” says Orangewood School Principal Andree Charlson. The school, which prides itself on its environmentally focused learning, was also in desperate need of additional classroom space. Before

Green Schools: Student Health and Performance

Green schools aren't just good for the planet; they're good for students' health and learning, too. According to a 2006 Capital E report called *Greening America's Schools* that was cosponsored by the Federation of American Scientists and the US Green Building Council, among others, students in healthy schools (i.e., schools with nontoxic materials, adequate ventilation, and that utilize natural daylight) are absent less often and perform at a higher level. One recent study cited in the report, of green schools in the state of Wash-



ington, found a 15-percent reduction in absenteeism and a 5-percent increase in test scores.

That's not surprising, considering the abysmal condition of so many conventional US schools. According to the same report, some 55 million American students attend schools that are unhealthy and restrict their ability to learn. The National Center for Education Statistics, in fact, estimates that American children miss more than 10 million school days each year as a result of asthma and other respiratory ailments related to poor indoor air quality.

Think that green schools sound great, but they're not feasible given the current economy and the budget cuts most districts are now facing? *Greening America's Schools* found that building a green school costs less than 2 percent more than traditional construction—yet offers 20 times the financial benefits, like lower energy and water costs, improved teacher retention, and lower healthcare costs. The full report is available at www.usgbc.org/ShowFile.aspx?DocumentID=2908.



Ground was broken on an expansion of Orangewood School in Phoenix's Washington Elementary School District earlier this year. When renovations are completed in December, the new high-tech, state-of-the-art sustainable school will highlight the campus' STEM curriculum.

the expansion project, music and art classes were sometimes taught in hallways or even outside in the oppressive Arizona heat. When groups had performances or large presentations were scheduled, students had to walk two miles to facilities at the nearest high school.

These treks will be a distant memory, however, when Orangewood opens its 6,000-square-foot, \$2.5 million Green Schoolhouse this December. The design, dubbed "The Studio" (there are three different customizable Green Schoolhouse models: one each for elementary, middle, and high school), will have a performing arts focus with stages and a recording studio.

Charlson and the teachers are particularly excited about the potential for environ-

mental education in the Studio's STEM classroom. "The teachers are working together to design lesson plans that utilize the features of the new building," Charlson says—features like the school's solar panels and rainwater harvesting system. "They'll be able to focus on hands-on investigations covering subjects like recycling, water reclamation, and ways that solar energy can be used in daily life."

Orangewood will also use the new STEM classroom as the hub for the robotics program it runs for its middle school-aged students in conjunction with DeVry University and Arizona State University. Each year, a challenge is introduced to the robotics students, who work collaboratively to create a robot that will perform specific

tasks around their school. Last year, the theme was food safety; this spring, it will be alternative energy.

All this is even before the new Green Schoolhouse has been constructed. One can only imagine the types of green tech projects that will be realized in the many years to come.

While Charlson is "excited by the opportunities this will allow us to share with our students," it's not lost on her that by receiving a Green Schoolhouse, her district now stands among the most privileged.

"Can a Green Schoolhouse model be replicated on a larger scale?" Charlson asks. "With regard to the ideology, educating our children in energy-efficient facilities that demonstrate principles of long-term energy conservation and environmentally friendly materials, the answer is an emphatic 'yes.' We not only can, but we have an ethical obligation to our children to try." **the**

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- **Brighten A Life**
brightenalife.org
- **Cause and Effect Evolutions**
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- **Cisco**
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