

U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools



Highlights from the 2014 Honorees



U.S. Department of Education - 400 Maryland Ave, SW - Washington, DC 20202
www.ed.gov/green-ribbon-schools - www.ed.gov/green-strides



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Introduction

You may have heard that ED has fairly limited authority from Congress in the areas of school facilities, health, and environment. The good news is that U.S. Department of Education Green Ribbon Schools (ED-GRS) has enabled the agency to work in unprecedented ways with counterparts at the Environmental Protection Agency; the U.S. Departments of Agriculture, Interior, and Energy; and other natural resource agencies; as well as collaborators across the private sector, to share hundreds of effective programs for schools and, of course, spotlight the best practices across the nation of our selectees.

In the same way that we are working together across federal agencies like never before, in order to select their nominees to ED, state education agencies also have collaborated in exceptional ways with their state health, environment, and energy agencies. And private sector, both for-profit and nonprofit, has gotten involved at federal, state, local, and school levels, working with schools and governments. Through all of this new collaboration, ED's recognition award has become a tool to get your government working better together to the benefit of students across the nation. Now that's something we can all get behind, whether red, blue...or green!

The ED-GRS Pillars of reduced environmental impact and costs, improved health and wellness, and effective environmental education remain the same. Increasingly, and particularly among the district awardees, honorees' efforts are the result of new, more coordinated policies at the intersection of environment, health, and education at state and district levels -- precisely what we had hoped this award might encourage! We are pleased to see that the award has prompted schools and administrators nationwide to acknowledge the critical need for students to learn in a manner – and a place -- that will sustain both them and the planet. These green schools have taught us that it's not just *what* students are learning; the *where* matters too.

Over the last three years, we've been thrilled with the new collaborations at the federal, state, and local levels as a result of ED's green recognition award. But the collaborations that inspire us most are those of our school and district honorees that have built alliances to enable their phenomenal work. Apart from progress in all three Pillars – not just one – you'll notice another common thread among them: All have been tremendously resourceful in partnering with nearby businesses, parks, colleges, farms, museums, nature centers, sporting facilities, religious institutions, townships, and countless other entities.

Our honorees are by no means the wealthiest schools and districts. In fact, over the last three years, nearly half of our honorees have educated underserved student populations, and not because we have a special award category for them. When it





comes to green schools, these high-poverty schools come out on top when everyone plays together. That green school practices continue to be used as a tool to improve the built environments, health, and engagement of students that might seem to have the slimmest chances for success, and that they are once again, excelling and thriving as a result of these efforts, is no longer a surprise to us.

This year's selectees were confirmed from a pool of candidates voluntarily nominated and exhaustively reviewed by 30 state education agency implementation teams. While selection processes vary from state to state, selection committees are generally comprised of members from several state agencies as well as outside experts. In the second step of selection, states' nominees to ED were reviewed by our team of several dozen federal reviewers from across five agencies. This year we have selected 48 schools and 9 districts to spotlight their exemplary efforts to make their schools healthier, safer, more cost efficient, and sustainable – for all to emulate.

Across government, we again were awed and inspired by the efforts undertaken by the schools and districts selected. The U.S. Department of Education Green Ribbon Schools and District Sustainability Awardees prove that any school or district can take simple steps to cut costs and improve the health, safety, and educational adequacy of school facilities; ensure good nutrition and fitness practices for a lifetime of wellness, productivity, and achievement; and use the environment as a lens to engage students in hands-on learning in STEM subjects, languages, social studies, arts, and humanities.

Schools can use this sustainability context not only to boost test scores, but to teach students the important civic values and skills that will encourage them to grow into responsible, compassionate, and contributing citizens. Furthermore, this interest in the natural world and engagement in environmental concepts from an early age nurtures precisely the type of thinking that the technology and sustainability careers of the future require, whether these students graduate from green career and technical programs or green college preparatory schools.

This sustainable education doesn't begin in high school – or end there. Healthy, safe, educationally adequate school environments, wellness practices, and environmental education are for every student, every year, from the earliest learners, because all students deserve that strong foundation. Further, just as our pre-K to 12 school and district honorees use resource efficiencies to cut millions of dollars in utility costs, the colleges and universities where students continue their studies very well can use the same practices to reduce costs -- and pass these savings on to attendees!



Speaking of postsecondary institutions, you may have wondered what's next for ED-GRS, now that we have a school and district award, a Green Strides resources-sharing portal, and an annual best-practices tour. Well, it just so happens that we've added a postsecondary category this year, which we hope colleges, universities and their state authorities will take on with the same gusto as the district and school categories.

It is with tremendous pleasure and great pride that we present the third annual cohort of U.S. Department of Education Green Ribbon Schools and District Sustainability Awardees. These schools and districts are ensuring that their students learn to live, work, and play with sustainability and health in mind, not as an afterthought, but as an integral part of everything they undertake, from cradle to career.

The 2014 Green Ribbons are finally here. Prepare to be amazed! We were. When you recover, go to our www.ed.gov/green-strides page and get started using some of the very same tools these schools and districts employ.

Andrea S. Falken

Andrea Suarez Falken
Director, U.S. Department of Education Green Ribbon Schools and
Facilities, Health, and Environment Liaison



Honorees at a Glance

U.S. Department of Education Green Ribbon Schools	48
District Sustainability Awardees	9
Total Honorees	57
States Represented	27
Public Schools	39
Private Schools	9
Disadvantaged Schools and Districts	21
Rural Schools and Districts	18
Early Learning Programs	10
Charter Schools	3
Magnet Schools	1
Career and Technical Schools	3
USDA HealthierUS Schools Challenge Participants	58
Farm to School Programs	48
LEED-Certified Facilities	13
Collaborative for High-Performance Schools Projects	1
On-Site Gardens, Outdoor Classrooms and Schoolyard Habitats	200+
Safe Routes to School Programs	23
On-site Renewable Energy	43
National Dairy Council Fuel Up to Play 60 Participants	130
Smithsonian/ NOAA Project GLOBE Participants	4
Keep America Beautiful Recycle Bowl Participants	3
EPA ENERGY STAR Facilities	14
Clean Air Campaign Participants	2
National Wildlife Federation Eco-Schools	25



2013 U.S. Department of Education Green Ribbon Schools

Alabama

Brock's Gap Intermediate School, Hoover, Ala.

A Community of Service ... Because Going Green Saves Green

Brock's Gap is a new school, but its building is all too familiar to the community. In an effort to alleviate overcrowding, the city system implemented a building realignment and "recyclabuilding" plan. At the heart of the plan was a new intermediate school that was recycled from the old R.F. Bumpus Middle School building into Brock's Gap Intermediate School (BGIS). The three-story building sits on 25 acres and houses over 800 fifth- and sixth-grade students. Daylighting is an important component of the school's design. The lunchroom is designed to use natural light to illuminate its space as a way to reduce reliance on electric lighting during daylight hours.

Students conducting online research, creating websites, maintaining blogs, assembling multimedia presentations, using nature apps to acquire scientific data, and otherwise manipulating various technological equipment to acquire and record knowledge and understanding is just a snapshot of what you will see when visiting BGIS. Administrators and stakeholders understand simple efficiency measures in the use of technology are needed to save energy, resources and the environment. With the help of EPA's ENERGY STAR, BGIS has adopted a strategic energy management program. As existing desktop computers wear out, BGIS is planning to replace them with handheld personal devices that use less energy and emit less heat, which has the effect of reducing air-conditioning costs. Costs have been cut by replacing paper resources with Smart Boards, electronic communications, and downloading assignments to student devices rather than paper handouts. A technology expert and educator trains staff in how to use the school's technology appropriately, saving the costs of hiring expensive

BGIS is teaching students to make healthy food choices in school and at home. BGIS is making meals with leaner meats, whole grain ingredients, and less sodium and added sugar. All food at BGIS is baked or steamed, never fried. Students are encouraged to try more fresh produce through fruit and vegetable taste tests, Farm to School programs, school gardens, and kids' cooking classes.



consultants. Future plans include the use of free cloud applications to replace almost all desktop software, which will save expensive licensing costs. Because BGIS uses Microsoft software for many of its key applications, it was natural for the district to choose Microsoft Hyper-V as its preferred hypervisor, and the resulting hardware consolidation has saved BGIS \$21,000.

Students and staff at BGIS are participating in Recycle Forward. This program is a collaborative effort between Cartridges for Kids and Digital Wish. In addition to recycling various technologies, BGIS implements several aggressive approaches to help reduce solid waste and eliminate hazardous waste as well. EPA Indoor Air Quality Tools for Schools and suggestions from a recent IPM assessment currently are being implemented, and students and faculty are proud to be members of the Alabama Clean Campus Program.

Improving the health and wellness of students and staff is a priority. BGIS has been improving school meals and working to teach students how to make healthy choices in school and at home. BGIS is making meals with leaner meats, whole grain ingredients, and less sodium and added sugar. All food at BGIS is baked or steamed, never fried. Students are encouraged to try more fresh produce through fruit and vegetable taste tests, Farm to School programs, school gardens, and kids' cooking classes. All students and grade levels participate in a minimum of 120 minutes of scheduled physical education a week. Physical education includes calisthenics, sports instruction, and healthy living. BGIS is equipped with tennis courts, a football field, a softball field, an empty play field, and an outdoor low ropes course. Other health initiatives include asthma action plans for all students with asthma, along with no-idling and no-smoking policies.

BGIS' commitment to providing relevant sustainability education has been a journey that involves staff, faculty-trained volunteers, Partners in Education, and supporting organizations. Teachers participate in ongoing professional development on sustainability topics. Students are educated about environmental issues through the Outdoor Classroom program, Eco-Schools, Project Learning Tree, Project WILD and similar hands-on problem-based experiences. Robotics and engineering academics are a vital role in the education of BGIS's students.

Future plans for BGIS green technologies includes the ability to look at real-time usage of power, water, and gas, as well as using energy-management software. These added green technologies will be vital in providing essential information so BGIS can best focus its attention and resources on students.



F. E. Burleson Elementary School, Hartselle, Ala.

Great Habits Grow Great Leaders

F. E. Burleson Elementary School (FEB), with an enrollment of 384 students, 43 percent of whom are eligible for free- and reduced-price lunch, is one of six schools in the Hartselle City school district. The school community recycles pop tops, paper, plastic bottles, ink cartridges, and aluminum cans, and partners with the environmental club of a nearby high school in a battery-recycling effort. Students and faculty participate in Project Learning Tree, Alabama PALS, 4-H, and the Junior Master Gardener programs. Current Junior Master Gardeners lead the school's recycling education and remind students and staff to conserve energy. As a result, the school's current ENERGY STAR rating is 91. FEB also is a WeatherBug station, which provides online interactive tools for delivering lessons in math, science, and geography using live data.

The FEB Wellness Team consists of a school nurse, cafeteria worker, custodian, parent representative, and an administrator. This team meets monthly to report any health or safety issues. The Wellness Team writes a Wellness Plan each school year that is available at the central office and the school office. All faculty and staff are required to read through the plan and adhere to the policies each year.

All students are required to take a physical fitness test in the spring, with the results being sent to the state department of education. Students in grades 1 through 4 receive 45 minutes of physical education each day. Pre-kindergarten and kindergarten students receive 40 minutes of physical education each day. The school also participates in Fuel Up to Play 60 and Let's Move! Active Schools.

FEB started participating in the USDA's HeathierUS School Challenge during the 2013 school year. Raised garden beds have provided food for students in the extended day program to take home. The Junior Master Gardener students have harvested and prepared some of the vegetables they have grown.

FEB boasts an Alabama Certified Outdoor Classroom, providing numerous benefits for learners not found in the typical classroom setting. This hands-on learning environment gives students an intimate glimpse into the natural world around them, more so than merely studying it from a book. With help from the Alabama Wildlife Federation, FEB's outdoor classroom became certified in 2010. The facility is designed to help children develop awareness and appreciation of their environment. The classroom includes stations such as a 15' x 25' glass greenhouse; worm composting; bird habitats, including feeding areas, watering areas, and nesting boxes; butterfly habitats and attraction areas with host and nectar plants; a Koi pond; and an amphitheater with a stage and outdoor musical instruments.



Teachers participate in STEM professional development in association with the National Center for the Advancement of STEM Education, which is sponsored by the U.S Department of Defense on the University of Alabama at Huntsville campus. This professional development provides teachers with tools that promote real-life application of science and technology. Wheeler Wildlife Refuge sponsors a recycling art project that the fifth grade has participated in each year, with many FEB students winning awards for their projects.

Geothermal wells were installed when the school initially was built in 2001. By natural regulation of the temperature, energy costs were lowered, and within three years of the initial installation, the wells paid for themselves. Skylights are located in the science lab and pre-kindergarten classroom. The ambient light enables faculty to use fewer resources for lighting.

Homewood Middle School, Homewood, Ala.

A "Movement" of Sustainability and Wellness in a LEED Silver Facility

Homewood Middle School (HMS) is a unique school with a dedicated population of staff, students, and community members that are working to develop a culture of environmental education and green living practices to match their incredible facility. HMS was the only LEED Silver-certified middle school in the nation in 2008, and the first LEED-certified building in Alabama. Within the school, a number of programs contribute to an overall mission of creating a school where teachers and students work to better themselves, their school, their city,

HMS' garden is home to the only community garden in the city of Homewood. Community members have learned new techniques for rainwater harvesting from the students.

and their planet.

In February 2012, a team of teachers organized a schoolwide recycling program that taught important skills to students with special needs. The students advertise the recycling program, work to make the program more efficient, and manage the materials that are recycled. Participants in the middle and high school recycling programs have effectively worked with staff of local nonprofits to ensure the continuing success of the program. WastePro provides the pickup for the middle school paper recycling program every two weeks. The Alabama Environmental Council and Recycle Alabama provide online resources that align with the Alabama Course of Study. During the 2013-14 school year, in addition to paper, plastic



bottles and cans are being recycled. At lunch, students have been asked to keep their milk or water bottles. The HMS parent-teacher organization recently provided funds for uniform, reusable bags with a “HMS Recycles” logo. The custodial staff commented on their reduced trash loads as a result of the school recycling program.

The goal of the school garden is to equip students to become informed adults, capable of making healthy environmental decisions that balance cultural perspectives, the economy, public health, and the environment. HMS’ garden also is home to the only community garden in the city of Homewood. Community members have learned new techniques for rainwater harvesting from the students, while the students have learned about the importance of planting flowering plants from the local garden club. During the winter holidays the HMS environmental club, the city of Homewood, and Recycle Alabama partner to recycle Christmas trees that go back to the garden and city parks for mulch. HMS, as a community and a school system working together, is creating a model for what can be accomplished toward sustainability.

The school’s wellness program started five years ago with group cycling classes available for students during school hours and employees before and after school hours. It has expanded to include a systemwide employee wellness program designed to promote healthier lifestyle choices for employees in the Homewood City School System. Known as “The Movement,” the program has continued to expand. As a result, HMS has received the Birmingham Business Journal’s Healthiest Employer Award. Students are now registering for local races, coming to school early, and staying late to focus on fitness and improve wellness. The Movement has brought the community closer together. The Homewood police chief can be seen at spin class on occasion, and students, teachers, and community members often can be seen exercising together.

Many teachers in the school and extracurricular programs have incorporated environmental awareness and sustainability into their curricula. A team sponsored by the enrichment teachers did a community service project with the Aga Khan Foundation, where they created exhibits that taught about the foundation’s work in improving the environment in developing countries. The special education classrooms work in the community garden and manage the recycling program. Family and consumer sciences and career and technology classes create eco-friendly products, such as deodorant and frames for the garden beds. While there is not a written sustainability curriculum at HMS, many teachers have incorporated environmental learning into their classrooms. A select group of students participate in the Technology Student Association each year. These students often are charged with a STEM, green technology, or environmental challenge. For instance, in 2014 the Technology Student Association conference has challenges such as agriculture



and biotechnology design, energy sources, environmental focus, Go Green manufacturing, Junior Solar Sprint, and water infrastructure.

The true innovation of the green living programs at HMS is the collaboration between groups of students, 31 percent of whom are eligible for free- and reduced-price lunch, and teachers who rarely interact in many schools. The community garden has provided a central project from which special education students, gifted education students, career and technology students, English language learners, and general education classrooms all benefit. Students, teachers, and parents are developing relationships that improve the school culture and climate. As these programs continue to grow, the partnerships that have resulted from the community garden, the recycling program, the integrated curriculum, and the wellness program, provide a model for many schools with similar resources and facilities.

California

Lowell Elementary School, Long Beach, Calif.

Growing, Conserving, and Learning-by-Doing

Lowell Elementary School has a comprehensive program to promote green practices at school, at home, and in the community. With students as the primary decision-makers and stewards, school programs promote exercise, carbon-reduction, resource conservation, and healthy choices. Staff, community partners, and 80-plus parent Green Team volunteers work together to provide unique, hands-on environmental education for every student. Every Lowell child participates in the Green Team's Learning Garden, totaling 8,000 instructional hours per year. This unique curriculum was developed on-site. It is volunteer-taught and academic-standards-based, providing enrichment and supplemental lessons for every grade level in science, social studies, ELA, math, art, and the humanities.

The learning garden began with three raised beds in 2006, and has evolved into a thriving outdoor educational program that teaches all students the connections between healthy food choices, a vibrant community, and environmental stewardship. Over time, volunteers built three additional raised beds; created five colonial plots; and designed a new outdoor classroom with five more raised beds, student seating, teaching areas, and composters. In 2012, the California State Parent-Teacher Association recognized the learning garden, which includes a National Wildlife Federation-certified habitat and Monarch butterfly waystation, with its Spotlight Award. The learning garden has an especially strong connection to special education students, who use the area for weekly lessons on natural resources,



healthy food choices, and manners. This is a place where all children participate in meaningful experiences and foster a sense of caring and community. The Lowell Green Team also promotes responsible resource management in all aspects of student life. Student members divert more than 28,000 gallons of classroom recyclables annually from the trash.

Since 2012, Lowell has worked with the nonprofit organization Grades of Green, along with the City of Long Beach, to provide schoolwide waste reduction assemblies, and to help students sort lunch waste into trash, compost, and recycling. Fifth-graders perform detailed waste audits and supervise sorting stations, reducing lunch waste by 68 percent so far. In the learning garden, students use washable plates, silverware, cups, and cloth napkins, and discuss how to reduce their carbon footprint. Car-Free Fridays, promoted and measured by the student council, eliminate more than 150 pounds of CO₂ each week and encourage exercise. In January 2014, Lowell held its first electronic-waste drive with E-Recycling of California, and created a video to teach students the importance of recycling electronic materials. To reduce water usage, volunteers planted native and drought-tolerant gardens. To increase permeable surfaces on campus and capture particulate matter in the air, Lowell partnered with design firm Studio One Eleven and Long Beach city council member Gary DeLong to plant 48 trees on-site.

The Solar Bench will allow Lowell students to analyze and understand benefits of solar power as a renewable energy source and emerging technology.

The Long Beach Unified School District has reduced overall district energy costs by \$3.6 million/year since 2002, and Lowell is doing its part to reduce its environmental impact and cost. One hundred percent of onsite irrigation is now from recycled water, and an innovative Solar Bench soon will power the sprinkler system and electrical outlet in the outdoor classroom. Although the main school building dates to 1926, the school was able to achieve ENERGY STAR certification with a score of 98 in 2013.

At Lowell, student and staff health is a priority. The school has strong indoor air quality and Integrated Pest Management programs, including radon testing, no routine pesticide applications and classroom construction designed with achievement-promoting acoustical performance and natural lighting in mind.

The PTA funds a certified physical education teacher through activities such as the signature Pennies for PE event and the Long Beach Fire Department Saturday Breakfast. All students log at least 200 minutes of physical education every two weeks, and all students and most teachers participate in the annual Jog-a-Thon.



Fifty-five percent of students walk or bike to school, and alternative transportation is promoted on Car-Free Days. In 2012, the City of Long Beach and Bike LB installed new, onsite bike racks; additional bike racks are slated for the front and side of school. Students take more than 15 walking field trips each year, and use public buses to the library, Ralphs supermarket, and Rancho Los Alamitos supermarket.

Lowell emphasizes proper nutrition. All learning garden lessons—which involve students, teachers, and parents—focus on the importance of healthy food choices. Students grow and eat organic produce, build digestive system models, and use computers to research and understand nutrition. In 2012, fourth- and fifth-graders partnered with King Arthur Flour for a skill building and community service project in which students baked two loaves of bread—one to keep and one to donate to Meals on Wheels—and 147 loaves were donated.

Lowell is preparing its students for college and career with a host of on-site opportunities. The Solar Bench will allow students to analyze and understand benefits of solar power as a renewable energy source and emerging technology. The solar contractor and others with careers in alternative energy and the care of natural resources speak to students on Career Day. In the learning garden, students mimic farm-to-table careers including farmer, harvester, processor, and distributor. They also conduct interviews with farmers at the local farmers market and visit farms. On annual Merchant Mentor Day, students shadow 20 locally owned or operated business leaders, reinforcing curriculum about producers and consumers, the importance of buying locally, and what makes a community.

Mark Twain Elementary School, Long Beach, Calif.

Robust Recycling Programs Advance Sustainability and Wellness

Twain Elementary School was the first school in the Long Beach Unified School District, one of the 50 largest school districts in the country, to start an all-encompassing recycling program. In 2007, a parent realized that all lunchtime waste went straight into the trash can. Since that day, everything changed on campus at Twain. For over six years now, all waste from lunch has been separated between trash and recyclables every day in each of three lunch areas. Parents and Green Team students volunteer daily to help divert trash, reducing lunchtime waste by 85 percent. Add to that the daily recycling of paper, cardboard, ink cartridges, bottles/cans, and drink pouches/chip bags.

The last Friday of each month is Bottles and Cans Day, in which students bring bags of collected items from home, earning the school more than \$2,500 annually from



recycling bottles, cans, and ink cartridges; and using TerraCycle for harder-to-recycle items. Drop-off stations are set up on the east and west sides of the campus and bags of recyclables are sorted by parent and student volunteers before trucks transport the materials to an on-campus storage container. Recycling income funds school programs that promote the environment and wellness.

Twain also runs a uniform-reuse program and other drives to help the school and families in surrounding areas. Students and staff celebrated the Center for Green Schools' Green Apple Day of Service with a Bottles and Cans Day and garden planting. Each year, Twain holds its Fit-A-Thon fundraiser. Students are sponsored in a day of physical fitness. Prizes, which are donated by local businesses, are raffled for those who donate, as well as for children who collect the funds. In 2008, with the help of a California State Garden Grant, parents and teachers built a 4,560-square-foot garden. Teachers take their classes to the garden to plant, tend, and harvest.

A Green Team advisor holds a recycling training day for all students at the beginning of the year. They receive instructions for separating their trash and recyclables in an orderly fashion, and are educated about the reasons behind Twain's recycling. The Green Team Club has reached 165 members, which is 35 percent of all eligible students. The after-school meetings are run by parent volunteers, and include instruction on recycling, reusing, packing trash-free lunches, buying in bulk, littering, storm drains, and water conservation. This is followed by crafts made from recycled materials. The Green Team also participates in park clean-ups, beach clean-ups, and Green Days at school.

Twain is an American Heart Association Teaching Gardens School. Classes hold "salad parties," and eat vegetables and herbs they have never tasted. The children learn how hard it is to turn the dirt, and revel in eating what they grow. The garden is an outdoor classroom, incorporating real-life learning into the science, history, literature, math, and social science curriculum, while allowing children to understand farm-to-table concepts. They have donated sunflowers to a local Alzheimer's home and donated produce to needy families. The school garden began with 11 raised garden beds and potted trees, but phase two of the garden's development drew in the whole community. The American Institute of Architects and a program for at-risk high school students interested in architecture, construction, and engineering teamed together to design and build an entry arch, small benches, and stadium seating made from recycled material, all intended for outdoor instruction. Twain families adopt the school garden for the summer months to ensure its maintenance.

Twain was chosen for a project by the Long Beach Arts Council for Eye on Design, in which all third-graders teamed up with artists to design public art for the Long Beach Airport, a local park, library, and the Twain Garden. Judges selected the



Twain Garden as the winning team, and the project (a globe mosaic sculpture) recently was completed and unveiled to the community.

Students take Green Team lessons home and inspire change within their families. They ask their parents to get bins for recyclables, teach their families what is recyclable, and learn that the best option is to reduce and reuse. The vast majority of students are using lunch boxes, thermoses, reusable water bottles, and sandwich containers. The Twain Green Team has received local media attention for its comprehensive green program, and serves as an ambassador of best practices for other schools in the school district. Green Team founders and volunteers have held workshops for other schools, presented at local workshops, and given campus tours during lunchtime. The Twain recycling program was recognized with the California State PTA Spotlight Award for Environmental Programming in 2012, and was featured on National Public Radio's "The Story" in May 2010. With the goal of educating schools all over the world on becoming "green," the Green Team recently completed a one-year project of creating an educational video titled "Start Your Own School Recycling Program - It All Starts With Us."

San Domenico School, San Anselmo, Calif.

Twenty Years of Elevating Sustainability as a Critical Issue of Our Time

San Domenico's mission, rooted in the Dominican spirit, is to address the critical issues of our time. The sustainability program was developed in 1994 to support the mission in concrete ways using curriculum, policies, and practices on campus as vehicles for change. The school has made significant efforts over the years and has been recognized nationally as a leader in sustainability.

The campus is home to a 412-kW solar-energy system, the largest school installation in Marin County, Calif. Photovoltaics reduce emissions by 860,000 lbs. per year, and offset up to 65 percent of school energy use. According to Pacific Gas & Electric Company analysis reports, the school's annual electricity use is 89 percent less than an average energy-efficient building, and gas use is 77 percent less. San Domenico was recognized as the top-ranking Emerald Green school in transportation through Safe Routes to School in 2013, with 75 percent of students choosing lower environmental impact and healthier ways to travel to school.

The sprawling 515-acre campus is devoted largely to ecologically beneficial uses (72 percent of the land), including a teaching garden, a rose garden, a small orchard, a lavender field, a native plant garden, eight beehives, a labyrinth, and oak woodlands with a trail system and creek. There are unique and ample opportunities for classes



to experience the outdoors. Students are provided with outdoor excursions such as local field trips, weeklong outdoor education camps, class retreats, and global travel opportunities.

Food scraps and landscape waste are composted and the school participates fully in the City of San Anselmo's recycling program, with a 64-percent diversion rate. A large-scale horse-manure composting system on site reduces disposal and soil import costs. The school supplies reusable dishes and flatware in the cafeteria and offers eco-party kits to classrooms. Water is conserved with low-flow toilets and shower heads, and by capturing spring water in three 10,000-gallon tanks that are used to water the school garden. Also, 100-gallon rain barrels, painted by students, were installed to collect water for potted plants on campus.

San Domenico received a \$50,000 grant that was used to provide an all-faculty training on ecoliteracy, host an ecoliteracy retreat for interested faculty, give stipends to 10 teachers to develop ecoliteracy units, and designate and provide stipends for ecoliteracy representatives at each school level.

The one-acre Garden of Hope features vegetable and habitat gardens, a pond, chickens, an outdoor kitchen, a cob oven, a straw-bale toolshed, and an orchard. The garden kitchen program, led by a chef, engages students in projects that foster healthy relationships to food, such as baking, canning, herb drying, cooking techniques, and sharing celebratory meals. San Domenico's Seed to Table garden curriculum offers weekly classes with a focus on nutrition and the benefits of organic and locally grown foods. The school lunch program sources produce within a 100-mile

radius, 30 percent of which is organic. Signs provide information on where food is sourced, and each month, a different environmental or nutritional theme is highlighted. Produce is supplemented by a one-acre school garden.

Pest management is handled by an outside, eco-certified contractor, through weekly monitoring of the campus. The school has eliminated routine applications so that pesticides are applied only when students and staff are not present. As a result, the school has reduced its pesticide use by 45 percent since 2008. They test for radon and meet high standards of indoor air quality. 95 percent of cleaning products are Green Seal certified. All classrooms and offices have multiple windows for cross-ventilation consistent with state and local codes. All buildings are designed to have windows in every area to provide fresh air and light.

Coursework at San Domenico weaves academic disciplines together to give a holistic view of human culture and thought. Because systems of knowledge are



interconnected, students are invited to encounter ideas within the complex fields that create them. Students conduct field studies at the Gulf of Farallones National Marine Sanctuary and the school participates in the Global Learning and Observations to Benefit the Environment (GLOBE) program, which is sponsored by the NSF, NASA and NOAA. Eco-literacy goals guide lessons and the school is developing sustainability standards in scope and sequence to deepen the existing curriculum. San Domenico was chosen as the only school to represent the U.S. in an essay and video competition on low-carbon living, sponsored by the city of Chong Qing, China. Two students were selected as winners and awarded a trip to China for a week of cultural exchange, touring, and learning about energy saving.

In 2009, San Domenico received a \$50,000 grant that was used to contract with Fritjof Capra and the Center for Ecoliteracy to provide an all-faculty training on ecoliteracy, host an ecoliteracy retreat for interested faculty, give stipends to 10 teachers to develop ecoliteracy units, and designate and provide stipends for ecoliteracy representatives at each school level. In partnership with Teens Turning Green, students participated in the Top Eco Chef Marin competition, through which they visited local farms and farmers markets, and paired with a local chef to make a healthy and ecologically responsible lunch. Bauman College nutritionists give workshops to seniors on how to live healthy in a college dorm. Teachers draw upon nutrition resources such Chew on This, What's On Your Plate, Fast Food Nation, and Omnivores Dilemma. Social justice classes study aspects of the food industry and present results at a symposium.

Encinitas Union School District, Encinitas, California

A Regional Model for Sustainability and Wellness

Consisting of nine traditional schools serving 5,400 students, Encinitas Union School District (EUSD) contains a National Wildlife Federation Eco-School, two Alliance for a Healthier Generation schools, and four National Wildlife Federation certified habitats, and is home to a strong districtwide green team and wellness committee. Both groups meet monthly, with meetings attended by the superintendent, school board members, department directors, teachers, parent volunteers, representatives from local businesses, and leaders of community organizations. The committees have worked together to bring about measurable improvements to the school district and the local community. From farming efforts, waste diversion, and daylighting to hand dryers, daily yoga, and solar-panel installation, EUSD is becoming a model for sustainability and wellness in the region.



EUSD's ten-acre Agro-ecology Learning Center (ALC), opening in 2014, is poised to be the focal point of the district—and the community—for years to come.

Leveraging public and private partnerships, EUSD will grow organic food for the district's farm-to-cafeteria program while also showcasing cutting-edge sustainable farming techniques and renewable energy technologies. The ALC is nestled among the San Diego Heritage Museum, a food justice sustainability farm, and the San Diego Botanic Gardens. Opportunities for hands-on learning about hydroponic and aquaponic farming, renewable energy generation, and fuel cell storage create a learning center like no other for students and community members. Not surprisingly, 87 percent of students scored advanced/proficient in Science on the 2012 STAR Tests and the district offers environmental education training tuition assistance for teachers.

A few major efforts among many serve as examples of EUSD's commitment to sustainability. Each of the nine elementary schools within EUSD has a robust educational garden, and many schools grow organic produce for school lunches, food pantries, and farmer's markets. Driven by the success of the garden and wellness programs at EUSD, two large-scale organic, sustainable farming efforts are blossoming within the district. The Ocean Knoll Educational Farm is EUSD's one-acre farm pilot. In its first year of operation, students harvested several hundred pounds of produce for the lunch program, in-class tastings, and the local food pantry. The farm is home to the first educational food forest, along with a greenhouse made entirely of recycled plastic bottles.

In addition to leading the way in farm-to-cafeteria efforts, EUSD also is a regional leader in waste reduction. In partnership with community organizations, EUSD has put a revolutionary waste diversion program in place at all schools. The SCRAP program requires all schools to institutionalize full-stream recycling and food-scrap composting. Customized lunchtime waste sorting units were created and placed at each school site, and every student, staff member, and custodian is trained to use the equipment. The board of trustees has accepted this new waste diversion protocol, and EUSD has realized a reduction of lunchtime waste of 85 percent. In 2013, EUSD's SCRAP program was recognized with a regional award from the California Resource Recovery Association for Best Waste Prevention Program.

Energy and water conservation are a large part of EUSD's sustainability plan. The district worked with the California Center for Sustainable Energy to develop an energy conservation plan, including automated and upgraded HVAC and lighting settings, bulb retrofits to existing lights, and comprehensive installation of daylighting, solar panels, and cool roofs. Work is underway for all schools to receive photovoltaic panels and daylighting Solatubes by 2016. In the first month following one school's completed Solatube installation, energy audits revealed a 15 percent reduction in energy demand. Students at the school are working with professionals



from San Diego Gas & Electric Company and The Energy Coalition to monitor the school's energy use and spearhead a best-practices campaign for the district. A systematic installation of rain harvesting at each school is nearly complete, with each installation accompanied by an educational rollout for students and their families.

Students are involved in all aspects of sustainability, and implement the principles they have learned in community service projects. In 2012, the district received an award from the Carlsbad Chamber of Commerce for Outstanding Educational Program for Environment, given for the ECO-LUTION program at El Camino Creek Elementary, which embraces project-based learning through student-driven waste diversion and garden programs. EUSD works actively with the San Diego Association of Governments (SANDAG) to promote their iCommute program and Safe Routes to School. Fifty-seven percent of EUSD students walk or bike to school on a regular basis, and an additional 15 percent carpool. EUSD schools placed first and second in SANDAG's 2012 and 2013 countywide Walk, Ride, and Roll to School Challenge. These winning schools received grants from SANDAG to purchase classroom supplies and instructional materials. SANDAG also recognized EUSD with their 2013 Diamond Award for the Best Walk to School program in San Diego County (2011 and 2012).

Colorado

Larkspur Elementary School, Larkspur, Colo.

Sustainable Change in the Community at Large

Larkspur Elementary is situated on nine acres in beautiful Larkspur, Colo. The school has received district innovation funds to implement an environment-based education program over the next three years. The program, Environment as an Integrating Context, or EIC, is a nationally recognized vehicle for improving students' learning through engaging them in community-based investigations, which result in student-led service-learning projects. EIC learning uses an integrated approach, through which students learn about the interactions between natural and social systems. Investigations, such as Bioblitzes, develop knowledge and understanding of, and appreciation for the environment, community, and natural surroundings. This schoolwide initiative has

In the lunchroom alone, Larkspur has reduced landfill-bound waste by 47 percent. In addition, the school has started a community e-waste- and textile-recycling program, reducing the school community's landfill waste stream and earning money for students.



led students to develop thinking and interpersonal abilities, and has caused them to take action to create sustainable change in the community.

As the Larkspur community has learned how it as a social system is affecting the natural system, students and staff have made considerable efforts toward reducing landfill and energy waste. Larkspur has instituted a large-scale recycling and composting program, making daily measurements of the number of bags of recycling and pounds of compost the school is diverting. In the lunchroom alone, Larkspur has reduced landfill-bound waste by 47 percent. In addition, the school has started a community e-waste- and textile-recycling program, reducing the school community's landfill waste stream and earning money for students. In addition, Larkspur is part of 4 TerraCycle Brigades, which repurpose recyclables. The school has installed a water bottle refill station, which keeps students hydrated and has diverted over 2,000 bottles from the landfill. The student energy team performs energy audits on a daily basis to ensure that the school community is turning off lights when they are not being used. These audits, along with delamping, have reduced energy usage by 24 percent over the past three years. As a result, Larkspur has earned district-paid incentive money totaling around \$20,000.

Larkspur takes pride in its longstanding garden initiatives that teach students about nutritious, organically grown foods. Over the past 10 years, parents, teachers, and students have built two outdoor gardens where students have planted, grown, and harvested vegetables. The district chef has come to show students how to take food from garden to table, and nutrition services has provided information and contests to challenge the kids to build a colorful plate full of vegetables. The school recently has formed a new partnership with Juice Plus/Tower Garden, which has allowed Larkspur to grow vegetables indoors during the winter months using vertical aeroponic gardens. Students are learning about this green technology, which only takes 10 percent of the water that a typical garden requires. Fourth-graders are learning about alternative forms of gardening as they plan, design, and build their own aquaponic gardens to learn how systems interact. The school also is home to a National Wildlife Federation certified habitat.

Larkspur also provides students opportunities to learn about the importance of being active, during before- and after-school classes, which include the running club, garden club, basketball, volleyball, and cooking classes. In addition, students have the opportunity to take part in sports camp during holiday breaks. Douglas County offers teachers the opportunity to take part in wellness challenges in which they can win prizes for working out, eating healthy, and getting wellness check-ups. Sixth-graders are creating a trail system on campus, which will be used to connect outdoor learning spaces and act as a community trail for the fitness-minded.



Lesher Middle School, Fort Collins, Colo.

A Brown and Gold Seven-time Energy Star

Lesher Middle School has made a commitment to sustainability in five areas: resource conservation, greenhouse gas emissions, education for sustainability, transportation, and health and wellness. This commitment dates back to fall 1960, when the school opened as a state-of-the-art representation of international school design on 10 acres on the site of the former Colorado State University farm. Even the initial choice for the school colors —brown and gold— was influenced by the local environment, as the school board and community were so taken with the brown and gold beauty of the brown-eyed Susans, a native northern Colorado flower that grew wildly around the farm. More recently, in fall 2006, Lesher completed a \$3.7 million remodeling, funded through a 2000 bond/mill levy. The result is a new media

A 3.7 million renovation at Lesher was funded by a 2000 bond/mill levy.

center, fitness center, art room, and general education classrooms with energy-efficient upgrades, including unit ventilators, solar tubes, double-pane thermal windows, solar shades, and new lighting. Few schools are as well-designed and efficient as 54-year-old

Lesher, an ENERGY STAR Award recipient in 2005, and every year from 2008 through 2013. Lesher is a school that maximizes its limited square footage to create a healthy learning and work environment for 750 students and 75 staff members.

An education is more than the learning that takes place within the walls of our classrooms. The school strives to improve student and staff health, reduce its impact on the environment, and promote sustainability education throughout the school. Seven porcelain drinking fountains were replaced with water bottle-filling hydration stations in 2013 to supply drinking water and eliminate single-use plastic bottles. The school also encourages waste reduction through recycling and hot composting. This has resulted in a 66.4 percent average diversion rate. Lesher also hosts the annual Bike-to-School Week, when nearly 40 percent of the students and staff reduce vehicle miles traveled by biking to school, logging approximately 4,000 miles. As for the grounds, Lesher has converted from traditional grass to xeriscaping to reduce water use and decrease stormwater runoff, and is host to the City of Fort Collins Nikki Lucas Natural Area.

Lesher recently created a wellness team that is active in promoting health and wellness for staff and students, 41 percent of whom are eligible for free and reduced-price lunch. Projects include Viking Wednesday after-school workouts led by physical education teachers, Fuel up to Play 60, a staff Biggest Loser weight-loss



challenge, the Iron Viking Suburban Adventure Race for students, and a 3-kilometer fun run/walk on the last day of school.

The school goes above and beyond by providing extracurricular enrichments focusing on sustainability education. Every teacher designs units focused through an environmental lens that lead to relevant sustainability education in all classes. Lesher recently created a sustainability class, in which students study the basic principles of sustainability and look into real-world issues, solutions, and struggles before applying their knowledge to the Lesher and Fort Collins communities. Lesher offers a variety of enrichment throughout the year that focuses on environmental education, including a field trip to the Catalina Environmental Leadership Camp on Catalina Island, Calif., to study the ocean's ecosystem and provide data for the Colorado River Watch Program.

Lastly, Lesher is a proud member of Poudre School District, one of two districts in Colorado recognized in 2012 as Gold Leaders by the Colorado Department of Public Health and Environment at the annual Environmental Leadership Awards ceremony. Poudre School District continues to be recognized as a platinum partner by Climate Wise, a voluntary City of Fort Collins program consisting of over 260 businesses and organizations committed to climate protection, environmental stewardship, and economic vitality.

Mesa Elementary School, Cortez, Colo.

The Wee "We-Cycle" Where Desert Meets Mountain

It has been said that from humble beginnings come great things. This statement reflects the efforts of Mesa Elementary School's dedicated staff and students to reduce the school's environmental footprint in rural southwest Colorado. Located in the shadow of Mesa Verde, Mesa Elementary is part of the Montezuma-Cortez school district. Nestled among historic landmarks, Native American reservations (the school serves 31 percent Native American students), and a striking desert-meets-mountain landscape, the district identifies itself as a community rooted in family, tribe, and tradition. Faced with socio-economic disparities, a transient student population, and turnover among staff, the district has encountered many unique challenges across schools. Despite these challenges, Mesa Elementary has persevered to become a dedicated leader in sustainability in Colorado.

On Earth Day 2009, Mesa's kindergartners launched a service-learning project that focused on recycling paper in the school. Teachers purchased dish tubs that were distributed to all 18 classrooms, with recycling logos taped on the side. Every



Wednesday the school office announced over the public address system that “Wednesday’s Wee We-cyclers” would be pulling their little green wagon around the school to collect the paper recycled by each classroom.

Word of mouth helped expand the project, and community friends pitched in to help. A member of the Four Corners Recycling Initiative helped bolster Mesa’s We-cycling program. The appearance of a big green dumpster in the parking lot put Mesa at the forefront of paper recycling for the district! The Dolores Public Lands office donated real recycling tubs to replace the dish tubs, along with recycling dumpsters on wheels, which have provided greater capacity and ease of recycling. The green wagon has been retired but still bears the sign taped to it that states “One person can make a difference...be that person!”

Mesa Elementary School is a remarkable place to work. Not only do the students, 58 percent of whom are eligible for free and reduced-price lunch, want to change the world, but also the school is filled with dedicated staff and administrators that support the students’ efforts to make a difference. Mesa is in its third year of working cooperatively with McKinstry, an energy-efficiency contractor, to address energy education and operational optimization. The campaigns spearheaded by this organization have challenged students and staff to continually assess, audit, and address energy and resource consumption at school and at home. A most heartening aspect of this initiative is the message students take home to share with their families. Students are energized when they realize that they have the power to affect and sustain environmental change. The education of students and staff has focused on the McKinstry campaigns to “Power Down,” “Take Action!” and “Turn it Off!” Students routinely ask what can be recycled. They tell one another to “Turn off the water – don’t waste it,” and “Don’t forget to turn off the lights!” The school’s proactive maintenance staff has worked hand in hand with McKinstry to improve operational performance within the school while making concerted efforts to implement ideas that reduce overall energy consumption, especially during holidays and summer breaks.

Staff support the health of students as well as each other. The movement education teacher brings a skill set and energy level that is unparalleled, providing opportunities and lessons that focus on lifelong fitness for students and staff. A community outreach committee, developed through a newly adopted literacy program, encourages staff to build partnerships with community organizations to promote literacy and healthy choices. Such partners include local fire firefighters who come in and read to students, the local health department, which provides dental screenings and follow-up care, and local farmers who share healthy food choices with students on “Colorado Proud” days. A partnership with the San Juan Mountains Association has provided exceptional environmental education lessons, resource materials, and field trips for students, including Project WILD and Project



Learning Tree professional development trainings for teachers with Colorado Parks and Wildlife.

Boulder Valley School District, Colorado

Board of Education-Mandated Sustainability Management Policy

Boulder Valley School District (BVSD) is building on 20-plus years of environmental stewardship and embracing environmental sustainability at a new level. The district hired a sustainability coordinator in summer 2008, and created a sustainability management system in the 2008–09 school year. In doing this, BVSD was able to coordinate existing efforts, and to define goals and visions around sustainability at a district level for the first time. In 2010, the board of education updated a critical policy designed to further support sustainability work in the district, and specifically BVSD’s sustainability management system. The policy language includes the commitment to “educate students about lifestyles and technologies that limit our negative effect on the environment and use natural resources in a manner that maintains quality of life and reduces consumption to a sustainable level.” It states that the district will “establish and operate healthful, safe, and productive learning environments while practicing environmental and fiscal responsibility.” In 2012, the district completed a sustainability progress report, which shares the district’s most significant accomplishments in sustainability practices since implementing the sustainability management system in 2009.

Some specific highlights of the district’s work include a 34-percent decrease in water use since 2008, and an 18-percent decline in energy use since FY 2010. The district has expanded renewable energy technologies from five schools and facilities to 28, and has offset more than 3,530 metric tons of carbon. Prior to 2008, BVSD installed 22kW of renewable energy. By 2011, BVSD had 123.4 kW of solar photovoltaic systems installed on 14 schools. BVSD owns these systems, which were funded through the Renew Our Schools Program grants and a 2006 bond. In June 2011, BVSD entered into a Power Purchase Agreement with Solar City to install large-scale systems (roughly 100kW) on 14 additional schools, for an additional 1.4 MW of solar power.

BVSD’s Environmental Services takes an aggressive approach to investigating indoor air quality concerns. It monitors for oxygen, carbon monoxide, carbon dioxide, hydrogen sulfide, methane (LEL), temperature, relative humidity and respirable and non-respirable particles. All BVSD facilities are tobacco- and smoke-free. Environmental services technicians work with maintenance HVAC personnel to



monitor airflow, fresh air supply, and problem areas. Investigations include a note of all cleaning products, air fresheners, and other chemicals that may trigger a reaction.

BVSD complies with the state mandate to test schools for radon, which was adopted in 1991. All results are recorded on building floor plans showing where and when each test was completed. Boulder Valley School District is a member of the Colorado Coalition for School Integrated Pest Management program. BVSD is involved with a pilot program created by the Colorado IPM group that will implement a student science educational tool that educates children on the IPM principles. It is a five-part curriculum that trains third-, fourth-, and fifth-graders to become trained “inPestigators.” They learn to identify what pests are, what is necessary for their habitat survival, and what is the best way to control pests and keep them out, all in a way that is gentle on the environment.

The district has expanded renewable energy technologies from five schools and facilities to 28, and has offset more than 3,530 metric tons of carbon.

BVSD has seen increased participation in two districtwide events: International Walk to School Day (33 schools participated in 2009, and 36 schools and 6,000 students in 2013) and BVSD Bike to School Day (3,233 students and staff registered in 2013). Half of BVSD’s schools are now composting schoolwide, and all schools recycle paper and commingled containers. BVSD also has many efforts in place to collect and properly dispose of hard to recycle materials.

BVSD has completely revamped the food services program to highlight and support healthier choices and local and organic foods, as one of 72 districts in the nation to receive a USDA Farm to School grant. BVSD Food Services hosts daily educational events in cafeterias across the district. On average, each elementary school has four events a year -- two food tastings and two nutrition education activities. Each middle school has two chef demos. An Iron Chef competition is held annually, which all schools are invited to enter by submitting recipes and participating in a cook off to win a place on the next year’s menu. In addition to the education provided directly by food service staff, 18 BVSD schools (over 7,700 students) participate in Garden to Table programs in partnership with the Growe Foundation and parent volunteers.

To facilitate students becoming literate in sustainability concepts, BVSD provides instructional experiences in sustainability concepts beginning in kindergarten. These concepts are learning expectations that are embedded within the BVSD curriculum for every student. Teachers in BVSD typically approach these concepts in the context of interdisciplinary science or social studies units that integrate reading, writing and mathematics, as well as art. For example, as part of an interdisciplinary



STEM unit, teachers have second-grade students examine the question of “What makes a healthy forest?” Students gather data about the forest adjacent to their school and work with the neighboring middle and senior school to analyze some of the data. Schools participate in the Roots and Shoots program, in which every student in grades kindergarten through five works on a community-based action project. Many students choose projects with sustainability themes, including helping honeybee populations, reducing trash, and helping community housing residents plant gardens. Students approach these projects from an interdisciplinary lens with a focus on civic responsibility and creating positive change. A number of students interested in exploring sustainability concepts in even greater depth have conducted research projects with community-based mentors as part of the Science Research Seminar course. Student projects have included research on the feasibility of climate change mitigation, energy conservation, cleaner energy systems, water quality and invasive plant species. Environmental Sustainability, Natural Resource Management, and Urban Agriculture courses also are part of BVSD’s Career and Technical Education program.

Connecticut

Greenwich Academy, Greenwich, Conn.

Raising Girls to Be Stewards of Sustainability

Greenwich Academy is a private day school, serving 800 girls from prekindergarten to 12th grade. Greenwich Academy is committed to practicing responsible environmental stewardship, and supports the principles of sustainability in the school’s curriculum to help students understand their relationship with the environment and prepare them to be informed stewards of sustainability. Greenwich Academy supports health and wellness of both students and staff, and exemplifies sustainability in the management of its buildings and resources use. Each division (lower, middle, upper) has a student organization committed to helping promote sustainable practices and encouraging members of the school community to join this effort. There is a schoolwide green team headed by the facilities director.

The school is privileged to have multiple conservation areas on campus, which provide ample teaching opportunities. Classes use natural and wetlands areas on the grounds in science classes and physical education. Many classrooms overlook wetlands, and students can observe wildlife and enjoy the moments of peaceful reflection that such an environment provides. These areas are protected according to wetland management regulations. The Greenwich Academy community is committed to preserving this area for the future. From collecting and studying water





samples in the Long Island Sound, to a recent Upper School environmental biology expedition trip to the Amazon rain forest, students in all grades participate in field trips that deepen their connection and understanding of environmental issues.

Health and wellness are supported in the dining program, through hands-on curricular units focused on organic gardening, and in Greenwich Academy's extensive athletic programs. Greenwich Academy focuses on healthy environmental quality through participation in Indoor Air Quality Tools for Schools, Integrated Pest Management programs, and effective building management. Greenwich Academy has partnered with Sodexo to provide green cleaning services in all buildings. These practices provide a safer environment for everyone, and reduce the school's impact on the environment. Students and staff are encouraged to use the on-campus fitness center and to spend ample time outdoors. The cafeteria offers a variety of healthy options, and all are encouraged to eat healthy.

Greenwich Academy students learn about energy and water use, using the building data. By implementing various strategies, Greenwich Academy has reduced its energy consumption 15 to 20 percent in the last 5 years, realizing approximately \$200,000 in annual savings. With Sodexo as its facilities management partner, Greenwich Academy has implemented many improvements in its operating procedures that have resulted in reducing its overall environmental impact. From installing solar panels to encouraging reusable water bottles and promoting recycling, Greenwich Academy is committed to practicing responsible environmental stewardship and sustainability.

In August 2009, the newly renovated Middle School was awarded LEED Silver certification. Students learn about the green building features and the green roof on the upper school building. The school also actively monitors and controls building systems to optimize energy use. Use of daylight harvesting and LEDs helps to create a green learning environment, while green purchasing and waste-reduction strategies help reduce environmental impact. The building automation system manages energy efficiently during unoccupied hours and school breaks.

Students have built a nature trail through the wooded area adjacent to the school, and have started a small-scale composting program with the goal of capturing pre-consumer waste from the cafeteria's kitchen. Students are given opportunities to get school credit for independent-study courses like gardening and composting, and also have opportunities for internships with green organizations in the area.



Interdistrict Discovery Magnet School, Bridgeport, Conn.

Serious Science in the City at a LEED Gold Construction

Interdistrict Discovery Magnet School (IDMS) serves 524 students from pre-kindergarten to eighth grade. One hundred percent of students receive free breakfast and lunch. Located in Bridgeport, one of the poorest urban areas in Connecticut, the school offers students a learning environment that is rich in outdoor and field experiences in a very urban community. IDMS' curriculum has a strong environmental theme, supported by partnerships with local environmental educators, including the Discovery Museum, Fairchild-Wheeler School, the Connecticut Audubon Society, Connecticut's Beardsley Zoo, the Maritime Aquarium, and the Bridgeport Lighthouse after school program. Each experience allows students to apply what they learn in the school's 90-acre wooded campus. Students learn many lessons through hands-on work, including in the sustainable garden, while raising Trout in the Classroom, and during the Discovery School BioBlitz. The school includes a culture of students teaching students, with older grades sharing information from their studies with their younger peers.

All students participate in programs with the Maritime Aquarium, learning about neighboring Long Island Sound and the importance of human conservation of these marine resources. To help the school's urban students understand and interact with the school's extraordinary open space, the third through eighth grades work with the Connecticut Audubon Society and their Science in Nature program, learning about biomes and data collecting skills, which they then use in the Discovery woodlands BioBlitz. Fifth and sixth grade classes take these skills further through work with the Beardsley Zoo, learning about local fauna and biodiversity. Sixth-graders also are raising trout eggs to be released in the local river in May. Through this program they also share what they have learned about ecosystems, habitats, and lifecycles with younger students.

All classes participate in daily science lessons, receiving from three to five hours of instruction per week across a broad curriculum. Accomplishments are celebrated in Family Science Nights and at the yearly science fair, and students publish articles in electronic journals. Many staff has been trained in Project Learning Tree, and they implement those lessons in the classroom. The school science specialist actively seeks professional development, partnerships, and opportunities to help to expand programming. Each teacher receives monthly formal science professional development. Lessons regularly are cross-disciplinary, with classes combining writing skills, science topics and research, and mathematical use of data. Staff are encouraged to attend science conferences, and are participating in the Connecticut Green LEAF program offerings.





Discovery Interdistrict Magnet School is a LEED Gold-certified facility, with an extraordinary building. From the rooftop solar photovoltaic system, to low-flow fixtures, students are able to use green technology while they learn about green. IDMS has a growing green focus, with an active green team comprised of educators, administrators, and facility staff. The student council supports and initiates green activities, including a recycling program. The Bridgeport School District supports this work, most notably by reinvigorating Indoor Air Quality Tools for Schools program, and through a close relationship with facilities staff. Health and wellness are encouraged with daily activity, outdoor learning, lessons about nutrition and health, and participation in the sustainable garden. IDMS is working hard to be an exemplary green community, to share sustainability with students and their families, and to grow a greener culture in the community.

Delaware

Red Clay Consolidated School District (RCCSD), Delaware

Setting an Example with a Holistic Approach

Red Clay Consolidated School District (RCCSD) educates approximately 15,000 students in 14 elementary schools, six middle schools, five high schools, four special education schools, and three charter schools. RCCSD is passionate about achieving its mission to provide the environment, resources, and commitment necessary to ensure that every student succeeds. This passion means that RCCSD has adopted a holistic approach to balancing energy savings and reducing its impact on the environment, while improving the health and wellness of its staff, and always providing a first-class education to its students that includes environmental and sustainability knowledge and skills.

The district employs a dedicated energy manager who works in collaboration with the central facilities office to manage the energy consumption of each school in the district. As the second largest district in Delaware, RCCSD must expend substantial energy to achieve its mission. However, it has become accomplished at saving natural resources while never sacrificing its mission. Since the January 2005 start of the District's Energy Excellence Program, RCCSD has established itself as a leader in energy efficiency. This program provides the district with savings of over \$1 million per year while also reducing greenhouse gas emissions. Additionally, RCCSD was the first Delaware state agency to purchase electricity and natural gas from third-party vendors and the first to enter a Solar Power Purchase Agreement.



The district's maintenance and facilities departments constantly pursue new ideas, such as making use of the Indoor Air Quality Tools for Schools and Integrated Pest Management programs to improve pest management, contaminant controls, and moisture control. Indoor air quality is being improved with the current energy-savings project through the use of electronic air cleaners, which trap and filter up to 99 percent of airborne particles passing through the system to make sure cleaner air is distributed to all rooms in the schools.

To ensure that students, 50 percent of whom are eligible for free and reduced-price lunch, receive the appropriate amounts of time on health education, physical education, and physical activity, each individual school has a wellness committee tasked with execution of the districtwide wellness plan. This plan dictates the time in which these three facets of education will be completed at each grade level, and includes standards for integrating activities into other curricula and making use of grant programs. The plan includes strict guidelines for school meals and foods sold to students. RCCSD participates in the Fresh Fruit and Vegetable Program for several elementary schools, and sources produce from local and regional farmers. Some schools participate in school garden programs that integrate nutrition and science curricula. All elementary schools have been awarded the HealthierUS School Challenge bronze award. Through the DelaWELL Health Management Program, staffers have free access to a confidential online wellness assessment, onsite health screenings, wellness challenges, online and onsite health seminars, personal health coaching, and much more. Staff take steps to reach their health and wellness goals, whether they want to lose weight, get more active, quit smoking, manage stress, improve nutrition, and/or maintain a healthy lifestyle.

Thanks to a focus on energy savings, including a solar power purchase agreement and energy performance contract, as well as use of ENERGY STAR Portfolio Manager, RCCSD saves \$1 million a year in energy costs.

Many elementary schools and some high schools have school-based vegetable gardens. In each garden, each grade takes ownership of a different aspect of the garden throughout the year. For example, with the help of teachers, students calculate a budget for the necessary materials. One grade then prepares the soil (usually second grade). One grade plants the seeds (usually first grade). One grade maintains the plants (watering, weeding, etc.), and one grade harvests the vegetables. The students then prepare and eat the vegetables as appropriate. This effort is coordinated through the school cafeterias.





One of the guiding principles of the district is a commitment to the comprehensive examination and realignment of structures, supports, and resources necessary to provide all students with high-quality instruction. RCCSD is leveraging the aforementioned energy-saving performance contract project as a learning tool for students, through Trane's BTU Crew. Trane is a leading global provider of indoor comfort systems and solutions. The BTU Crew is an educational program addressing energy use and conservation in buildings, as well as exposing students to STEM careers that are fun and have a positive contribution to the environment. Through this project, fifth-grade students conducted energy experiments in their classrooms and analyzed the results. The students also tracked sources of energy waste and suggested reduction methods.

RCCSD continually improves its programs and leverages tools available from the Environmental Protection Agency, the Alliance for a Healthier Generation, the State of Delaware, Delaware Nature Society, and Healthy Food for Healthy Kids, to name just a few.

Florida

Broward County Public Schools, Florida

Preserving the Planet for Posterity through Partnership and Teamwork

Broward County Public Schools (BCPS) is the fifth largest school district in the country, with more than 260,000 students and staff, and won the Florida Green Schools District Award for the second time in four years. BCPS is driven by its commitment to environmental stewardship, including the Environmental Stewardship Policy 7014, which spans the entire hierarchy of the district.

BCPS has environmental initiatives at the district level that encompass different departments, such as transportation, facilities and construction, environmental conservation and utility management, information and technology, food and nutrition services, STEM and instructional resources. Across 307 schools, the district has edible gardens, wildlife habitats, energy initiatives, classroom recycling, and integrated environmental curriculum.

The Energy Tools for Schools plan requires a team-oriented process with direct involvement of staff and students. Techniques from the program have contributed to a reduction of energy savings each. BCPS reduced energy costs of more than \$34 million, and recently saved more than \$11 million in energy costs. From 2010 to 2013, BCPS has saved 219,649,498 gallons of water through outdoor irrigation





evaluations. During 2013 school year, BCPS saved \$323,132 in reduced potable water and energy. The Broward recycling program collected 1,000 tons of recyclables that were diverted from landfills, with a cost savings of \$1,200,000. This success is a true testament to teamwork throughout the county.

Environmental initiatives at BCPS schools include 54 butterfly gardens and 38 edible schoolyards. These numbers are increasing, with an additional 220 teachers participating in professional development from Florida Agriculture in the Classroom and an additional 70 teachers participating in professional development in NatureScape and NWF Habitat Stewardship.

Environmental stewardship continues to grow in the district with new initiatives such as Engineering Projects in Community Service, Project Learning Tree, Global Learning and Observations to Benefit the Environment (GLOBE), Learning in Florida Environments, community gardens, and the continuation of the P3 Eco-Challenge. BCPS was awarded an \$11.9 million federal grant to create and expand six elementary magnet schools that specialize in STEM districtwide environmental initiatives.

Schools across the district use Schooldude, a conservation management tool that tracks facility water use, energy usage, and conservation; and EPA's Indoor Air Quality Tools for Schools. The district is the first in the country to have achieved NWF District-wide Certification. There also are 149 NWF certified school yard wildlife habitats in BCPS. Other partnerships include the Great American Cleanup (21 schools, 3,845 participants, and 1,982 pounds of litter collected spring 2013); Earth Day and Green Apple Day of Service across the county; the Keep America Beautiful Recycle Bowl national recycling competition; Project Perch, which provides webcam interaction with burrowing owls; and an indoor and outdoor water audit program, in partnership with Broward County Natural Resources Planning and Management Division and the Environmental Education Council of Broward County.

There are 115 active Alliance for a Healthier Generation schools among BCPS. Each school has a Healthier Generation Team that consists of a variety of staff members from the faculty, administration, clerical staff, and the cafeteria. Many of the school teams meet bi-weekly to implement and promote health and wellness activities. The Healthy Schools Program encourages schools to follow the Six Steps to a Healthier School and implement seven different wellness categories to create a framework that sets specifications to make each school healthier. There are 128 Fuel Up to Play 60 schools in Broward County, each of which supports the Healthier Generation program with healthy eating and physical education. Fuel Up to Play 60 has a strong emphasis on eating breakfast and exercise. BCPS won the 2013 US Department of Agriculture Best Practice Award in the category of "Increasing Consumption of Fruits and Vegetables."



Students, 64 percent of whom are eligible for free- and reduced-price lunch, have applied STEM skills and knowledge to create habitats for local flora and fauna by designing and building garden space and nest boxes for various migrating and native birds. Recent units published by the STEM and Instructional Resources Department for kindergarten through fifth-grade students have kindergartners designing a sustainable edible garden; first-graders building a butterfly garden optimized for diversity; third-graders using their habitat to design solutions for survival in the wild; and fourth-graders becoming stakeholders investigating and defending their position regarding the hypothetical building of a train through the Everglades. Additionally, all fourth-graders learn about the historical issues involved in Florida's treatment of the environment with a unit using the story of the bird feather industry and its decimation of the native bird population. Many BCPS schools bring green architecture and engineering into many of the environmental initiatives. Over 60 percent of BCPS schools use their outdoor learning space to teach STEM content, knowledge, and thinking skills. There are over 50 schools that have transformed their schoolyard into outdoor learning environments.

Through environmental partnerships, BCPS programs have proven successful in encouraging schools to implement their own Go Green plans to reduce environmental impact and cost, all while providing effective sustainability education.

Georgia

Arcado Elementary School, Lilburn, Ga.

Twenty Years of Planting Seeds

Arcado Elementary School's philosophy on environmental education has followed that of Mother Teresa: "No great deed, but small deeds with great love." The school's environmental education committee has worked closely with students, teachers, and the PTA since its inception in the early

1990s, proving the program's sustainability and viability. Arcado Elementary School believes in planting the seeds of environmental protection to ensure the future of the planet and thus embraces the 4 Rs: Reduce, Reuse, Recycle, and Rethink.

Through collaboration and creative partnerships, Arcado has been able to reduce solid waste production through the actions of students, faculty, and staff.

The outdoor classroom also includes a bog garden, compost area, and herb garden that provide nectar for bees and butterflies and berries for birds.



To conserve water, the school practices xeriscaping. These limited irrigation and conservative landscaping practices help ensure that only minimal amounts of water are needed to maintain landscaping and school grounds. Plants, mulch, gravel, and grasses planted around the storm drain impede erosion in the outdoor classroom. Ninety-nine percent of plants in the outdoor classroom are native plants. The outdoor classroom also includes a bog garden, compost area, and herb garden that provide nectar for bees and butterflies and berries for birds.

Arcado partners with several nonprofit and community organizations to enhance student learning, and is focused on developing students to become strong environmental stewards. The school has a Green Team comprising fourth-grade students who assist the school with environmental programming throughout the school year. To be considered for the Green Team, students must demonstrate strong leadership skills and complete an essay. .

In addition, the school has an active environmental committee of teachers, PTA members, custodial staff, and administrators, which is involved in waste reduction and recycling programming. Faculty members and students share water and energy conservation tips, as well as waste reduction tips via weekly electronic faculty newsletters and a student-led morning news show. Arcado is proud to be part of the first school district in North America to buy low-emission diesel engines, with about two-thirds of the current fleet using these emissions-reducing engines.

The facilities are constructed on a concrete, nonporous slab. This slab contains a substantial vapor barrier, and is placed over a compacted soil base that acts as an additional barrier. Arcado Elementary has a forced ventilation HVAC system which constantly exhausts air to the outside of the building and replenishes it with fresh air. This constant air exchange prevents an accumulation of radon, a radioactive and hazardous gas, diluting it indoors in the same manner as it is in the outdoor air. Arcado's facilities provide protection against radon far superior to existing residential houses. All buildings are ventilated to meet standards set by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE).

To further enhance the school community's wellness, the Arcado PTA hosts an annual Fun Run, and 2014 marks the school's 17th race. The community event brings out runners of all ages, and many Arcado alumni return for this event. In preparation for the Fun Run, the physical education teacher sponsors a Fun Run Club, along with open gym mornings before school. Within the school, Arcado has a physical / occupational therapy room. This type of room offers all students, 51 percent of whom are eligible for free- and reduced-price lunch, a place to de-escalate, desensitize, and receive sensory feedback, which is proven to help students focus and pay attention for longer periods of time.



High Meadows School, Roswell, Ga.

Respect for the Natural Environment Pervades Every Element of High Meadows

High Meadows School is a private, nonprofit, coeducational, independent, nonsectarian day school for students in preschool through eighth grade. Established in 1973 and located on 42 wooded acres in Roswell, Georgia, High Meadows School's innovative, inquiry-based, integrated curriculum emphasizes love of learning, creativity, meaningful connections and environmental responsibility.

High Meadows School's commitment to the environment extends well beyond the curriculum, and the school believes in walking the talk as they make responsible choices with maintenance, building construction and renovation, and waste management, even receiving LEED Gold certification for the new Community Center Building. High Meadows has clear purchasing policies that are aimed at reducing environmental impact. The school has undertaken many actions that demonstrate reduction of environmental impact such as purchasing ENERGY STAR certified appliances, establishing and maintaining a comprehensive campuswide recycling program that recycles an average of three cubic yards of material per week, replacing old lighting fixtures with newer, more energy-efficient bulbs and fixtures across the campus, and by partnering with the Clean Air Campaign to challenge parents not to idle their vehicles during carpool time.

Improving the health and wellness of students and staff at High Meadows is a way of life. From choosing safer cleaning products to ensuring that all students have ample time for outdoor fitness, High Meadows makes significant choices that positively affect the health and wellness of students, staff, and families. High Meadows is deeply invested in the health and wellness of its community as well. Some of the actions taken to improve campuswide health and wellness include undergoing rigorous indoor air quality testing on a regular basis; having a clear asbestos-removal and remediation plan for older buildings; partnering with the organic and healthy food provider Wholesome Tummies to provide healthy lunch options; and sponsoring an annual farmer's market that is open to the community.

Since the school's earliest days, it has been committed to the health of the environment. Today, respect for the natural environment pervades every element of High Meadows, including curricular education, extracurricular activities, and a commitment to build and operate according to the highest environmental standards. Ask the youngest students where to throw your apple core, and they'll point you toward the compost, not the trash. Ask older kids about environmental responsibility, and they'll talk as much about the practical applications of real science





as the trendiness of the idea. Middle grades students study the earth and its ecosystems in even greater depth, including examination of environmental issues, evaluation of potential solutions, and plans for action. The High Meadows environmental education program combines the study of environmental science with environmental responsibility and is integrated into classroom activity and offered as part of the regular enrichment curriculum for grades preschool through five. The Middle Years curriculum goes even deeper and includes relevant literature, indoor and outdoor laboratory experiments, examination of environmental issues, and evaluation of potential solutions and action plans. Extracurricular opportunities exist for students who wish to pursue environmental studies and action on an even broader level.

The campus itself is an outdoor classroom, and includes an amphitheater; bird feeding stations; compost bins, meadows; butterflies/insect pollinators; vegetable, herb, flower and bog gardens; native plant landscapes; nature trails; picnic tables, benches and other study sites.

In recognition of the school's environmental leadership, High Meadows was invited to participate in statewide round table discussions sponsored by Captain Planet and the Turner Foundation. Led by national environmental leader Laura Turner Seydel, the group advances environmental sustainability in schools through both curriculum and facilities. High Meadows was the only private school, and the only preschool-through-eighth-grade school represented in the group. In 2010, High Meadows hosted the national Farm 2 Schools program for a one-day workshop taught by Georgia Organics, geared toward area educators.

Illinois

Woodland Primary School, Gages Lake, Ill.

Yoga for the Youngest Learners in a Very Special LEED Silver Space

In September 2013, Woodland Primary School received the LEED Silver certification for Existing Buildings from the U.S. Green Building Council. Woodland serves early childhood and kindergarten students, and is the first elementary school in Illinois to receive this honor. In working toward this award, students and staff made changes in the school that made a difference and can now be celebrated for years to come.

Many changes at Woodland occurred behind the scenes, with the support of the district's operations and facilities department. These included purchasing more



efficient water heaters and refrigerators, installing lights that turned on only when rooms were in use, and changing the water consumption of its toilets.

From the staff's perspective, making use of large community refrigerators instead of personal refrigerators or microwaves has been a big change that assisted with cost savings. In addition, recycling as well as purchasing environmentally-preferable products and turning off computers each day all have made a difference.

Woodland's facilities staff also adopted green and sustainable policies, involving waste management, procurement, and cleaning. The results speak for themselves. Electricity usage has decreased by 10 percent and natural gas usage by 15 percent – taken together, the equivalent of eliminating the average electricity used by 32 homes in an entire year. These combined reductions resulted in a cost savings to date of over \$30,000.

Woodland is not resting on its (building's) laurels. The school offers its staff physical education opportunities, including yoga, step aerobics, pedometers, traverse

Yoga in the Classroom is a way for students to take “brain breaks” during the day. Students take quick breaks from sitting in their chairs to stand up, stretch, work on their balance, and practice relaxation through breathing techniques.

climbing walls, a MyPlate nutrition unit, and the First Tee National Golf program. These activities were made possible through generous grants and partnerships with the Woodland PTA, Trustmark Insurance Company, Woodland Educational Foundation, and Boy Scout Troop #627.

In 2014, Woodland implemented the Coordinated Approach to Child Health (CATCH) program in conjunction with a local hospital to help support health and wellness in the school and community. CATCH is an integrated system involving

the classroom, cafeteria, physical education, and the home to teach children how to be healthy for a lifetime. The CATCH physical education curriculum offers children of all abilities the opportunity to develop skills and an appreciation for healthy activity.

The school has a policy of allowing only nonedible birthday treats to cut down on junk food consumption for all students, 34 percent of whom are eligible for free and reduced-price lunch. The school introduced Yoga in the Classroom as a way for students to take “brain breaks” during the day. Through DVDs and teacher-led instruction, students take quick breaks from sitting in their chairs to stand up, stretch, work on their balance, and practice relaxation through breathing techniques. All-day students attending Woodland have 30 minutes of outdoor recess per day. The Woodland Community Consolidated School District partnered with the Woodland



Educational Foundation to host an annual Wildcats Go Green 5K Fun Run. In 2013, Woodland won \$500 for having the most participants.

Woodland serves students ages 3–6 years old and therefore is responsible for introducing them to environmental topics and laying the foundation for the years ahead. The school's early childhood curriculum includes a unit on environment and resource preservation. Students create environmentally themed art projects, participate in planet-themed stations, and sing earth songs during this period of study. All early childhood and kindergarten students watch informative, non-fiction videos about recycling. Recently, Woodland's literacy specialist submitted a grant to fund the purchase of resources and materials to teach students what it means to be green. The grant, if awarded, would allow each classroom to participate in recycling activities, including matching and sorting, and provide a classroom display showing examples of how to recycle and make the best use of the planet's resources.

Indiana

Carmel High School, Carmel, Ind.

Everyday Practices, Worldwide Results

Through everyday practices, policies, and education, Carmel High School (CHS) shines as a green school. Contributions made by administrators, teachers, and students foster a robust learning community devoted to health, sustainability, and environmental and science education.

CHS has reduced its energy costs by installing energy saving bulbs, electronic ballasts, and LED lighting, and through energy education with Cinergistic (formerly Energy Education, Inc.). Over the past 20 years, CHS has reduced its total energy usage by 72 percent, greenhouse gas emissions by nearly 50 percent, and water consumption by nearly 55 percent. Trash compactors are used to reduce waste removal trips and landfill volume. These and similar efforts helped CHS receive ENERGY STAR certification in 2010 with a score of 90 and the Carmel Chamber Green Award in 2010.

Students use outdoor facilities for study and exercise, such as the arts garden, cross country course, rain garden, and wetlands. Student health is addressed through the use of green cleaning products, an Integrated Pest Management program, a ban on smoking, and the use of low-emitting paints, carpets, and other supplies to protect indoor and outdoor air quality. Air filters are replaced routinely, and facilities are inspected for moisture and mold. CHS uses a fuel-efficient bus fleet, and has





policies against no bus idling and for offloading 25 feet from the school. The CHS wellness committee is focusing on health and nutrition by developing public service announcements that will run during school announcements, highlighting physical activity and healthy eating. A salad bar is available to students for lunch.

CHS offers its students environmental education through earth science and physical geology courses, Advanced Placement environmental science, and Advanced Placement human geography. A civil engineering and architecture class, a Project Lead the Way course, teaches green building principles. Students in the Sustainability and Environmental Club grow and evaluate food in the district-sponsored community garden, and assist in educating their peers about recycling and environmentalism. Some students also serve on the Carmel Green Teen board, which awards up to \$6,500 in microgrants to student groups who create projects to reduce pollution, conserve natural resources, and/or save energy. CHS students have won grants to provide compact fluorescent light bulbs to 105 local homes, install occupancy sensors in CHS restrooms, provide rain-barrel and composting workshops to the community, plant trees and butterfly bushes, install water-saving showerheads in the school and community locker rooms, and purchase a pergola to display recycled art in the CHS arts garden.

St. Thomas Aquinas School, Indianapolis, Ind.

Translating Faith into Action

St. Thomas Aquinas School (STA), a small, urban, Catholic school, strives to translate faith into action. Serving approximately 214 students in kindergarten through eighth grade, STA's commitment to energy, water, and waste reduction, student health and fitness, and environmental education is apparent. From celebrating Earth Week, to forming an Earth Council, to partnering with local environmental groups and universities, STA is making strides in the green schools movement.

STA has made steady progress in its efforts to reduce waste and resource consumption. The school has installed low-flow toilets, new windows to reduce cooling and heating energy costs, and healthy, sustainable flooring. In addition, the school has a recycling partnership with Abitibi, and sends collected lunch recyclables to Terracycle. These efforts divert approximately 30 percent of the school's solid waste from landfills. Money earned from recycling is used to purchase birdseed for school grounds. STA's participation in the Keep America Beautiful Recycle Bowl also has earned the school a top-12 ranking for two consecutive years. There has been an approximately 19-percent reduction in school greenhouse



gas emissions due to the school's encouragement of biking and walking through a Safe Routes to School program. Some 47 percent of students routinely walk or bike to school, and another 5 percent occasionally walk or bike to school. Bicycle safety training is provided annually.

In 2003, STA created a National Wildlife Federation-certified Schoolyard Habitat to encourage outdoor exploration, study, and learning. The habitat houses Indiana-native plants that provide food, water, and shelter for birds, butterflies, and other small animals. Classes use the habitat for art, science, writing, and religion lessons, and use the garden to plant seeds and monitor growth. Vegetables from the garden are donated to the local food pantry or are eaten by students. One section of the garden, the Butterfly Nursery, has the appropriate milkweed and other larval host plants to be named a Monarch Waystation.

STA also takes into account the health and nutrition of its students and staff. Students remain active through physical education classes and recess. After school activities, such as karate, flamenco dancing, and sports, offer additional learning and physical activity time. Staff members are encouraged to remain fit by wearing pedometers to track daily steps. Families stay up to speed through monthly nutrition newsletters. To reduce asthma triggers, the school has banned smoking on school grounds, is inspected routinely for moisture and mold, and is cleaned when students are not present.

Sustainability concepts are an integral part of the STA curriculum. Students learn content knowledge about the natural world and its interactions. Natural materials, like shells, leaves, and seeds, are used as manipulatives in elementary school math classes. Social studies classes help students look at environmental concerns from local and global perspectives. Religion classes help frame environmental and sustainability issues as a way to care for our neighbors and for creation. Students respond to nature in art and language arts classes. In addition to using the Schoolyard Habitat for outdoor learning, STA partners with community resources, such as parks and universities, to visit prairie, river, and wetlands habitats. Junior-high students develop leadership skills and learn about the responsibilities of citizenship in an outdoor setting at a three-day camp. Mobile technology vans also are used by a local university program, Discovering the Science of the Environment, in which students map and collect data on trees and birds at the school. Professional development in environmental education is provided to teachers through programs including Project WET and Project WILD.

STA is committed as a school to caring for the world and its inhabitants.



Kentucky

Wellington Elementary, Lexington, Ky.

Conservation Makes Cents for Students

Wellington Elementary was built in 2010 and designed to be one of the most energy efficient and sustainable schools in suburban Lexington, Ky. At Wellington, costs are cut by implementing policies that reduce the school's impacts on the environment, and improve the health and wellness of students and staff. The school features photovoltaic solar panels, a rainwater capture and reuse system, a thermal hot water system, permeable pavers, a rain garden, automatic lighting controls, native landscaping, and an outdoor classroom. In 2011, Wellington was named a Kentucky Green and Healthy School, and in 2012 received ENERGY STAR certification.

Wellington has a student- and teacher-led sustainability team that monitors and

In the spring of 2013, 82.8% of Wellington students scored "proficient" or "distinguished" on state science assessments.

holds the school accountable for its sustainability initiatives. An energy assessment is conducted annually, and a plan of action to reduce energy consumption is implemented where needed. Students have worked with the administration and staff to implement a nightly computer shutdown, to monitor energy use, and to provide conservation reminders during monthly energy patrols. Wellington recycles in

every classroom. Student energy teams collect recyclables, educate their peers about how and what to recycle, audit waste bins for recyclable items, and transfer all recyclables to a recycling dumpster. Wellington follows a school bus- and automobile idle-reduction policy, under a schoolwide idle-reduction campaign initiated by the third-grade classes. Wellington has raised staff, student, and community awareness about energy reduction and sustainability through its Sustainability / Energy Night, Captain Current Energy Day, and presentations at meetings.

The asthma management program in the school is operated consistent with the National Asthma Education and Prevention Program's Asthma Friendly Schools guidelines, and a comprehensive indoor air-quality management program operates consistent with Indoor Air Quality Tools for Schools. Wellington has adopted an Integrated Pest Management program to reduce pesticide use. The school prohibits smoking on campus and school buses. Cleaning products (75 percent) are certified through Green Seal, and chlorine-free paper is used. Wellington also participates in a Farm to School program to use local, fresh food, and participates in the district's



Connect the Dots program to help students make balanced choices for their school lunch meals. Each lunch item is color-coded to correspond with the five components from the USDA MyPlate nutritional guidelines

The school offers effective sustainability and health education by educating students, families, and staff about connections between human and environmental systems, and how personal choices can improve human and ecosystem health at school and in the community. Environmental and sustainability concepts are integrated throughout the curriculum, and in classroom-based and schoolwide assessments. In spring 2013, 82.8 percent of students scored “proficient” or “distinguished” on state science assessments.

The entire 76,000 square-foot facility is used as a learning laboratory and teaching tool, and students lead tours that focus on Wellington’s unique sustainability components. Monthly sustainability lessons, which teach the students about the unique features of the school and the importance of sustainability for the environment, are the responsibility of each classroom. Professional development opportunities are provided for teachers to help them incorporate environmental and sustainability education in the classroom.

Wellington students and faculty take great pride in learning and working in an environmentally sustainable school.

Maryland

North Carroll High School, Carroll, Md.

Turning Off Tuesdays...Turning On Health

Serving a student population of approximately 780 students, North Carroll High School (NCHS) offers multiple opportunities for students, staff, and community members of Hampstead, Md. to contribute to the green school culture. Sustainability concepts are built into the NCHS weekly routine. For example, Turn off Tuesdays encourage students to turn off lights and electronics, Green Fact Fridays mean the distribution of recycling and conservation information around the school, and Walk for Wellness encourages students to go for a walk after lunch. The school displays health information throughout the school, such as an iPhone showcase that illustrates apps designed to help improve wellness.

A 2013 recipient of the Maryland Green School Award from the Maryland Association for Environmental and Outdoor Education, NCHS’ reduced



environmental impact is the result of contributions made by students, staff, and community members. For instance, students on the NCHS Green Team lead efforts to reduce the school's impact on the environment, along with school utility costs, both inside and outside the school. They encourage water and energy conservation by posting signs and reminders (in multiple languages) throughout the school to turn off faucets, and unused lights and electronics. The team also leads efforts in recycling, composting, and conservation, through which NCHS recycles approximately 50 percent of materials that otherwise would enter the waste system.

Outside of the school, there is a bluebird trail, running waterfall, no-mow zone, songbird habitat, and American chestnut orchard. These areas are used to educate students – including those from a neighboring elementary school – about the need for native habitat restoration, the importance of biodiversity, and the interconnection among native plants and animal life cycles. The chestnut orchard was planted and is maintained through a collaborative research effort to restore the American chestnut. Partners include Carroll County Public Schools, the American Chestnut Foundation, and Thorpewood, a nonprofit organization dedicated to environmental education.

The health and safety of students and staff are serious business at NCHS. Hazardous materials, including mercury, have been prohibited since 2000. All flammable materials and other chemicals are properly stored and monitored, and approximately 75 percent of cleaners are green-certified. To keep air healthy and to reduce asthma triggers, smoking is prohibited on campus, all flowering plants are away from intake vents and windows, buses are offloaded 25 feet from the school building, and air filters are monitored and changed routinely. NCHS also participates in a Farm to School program, through which students are offered as many fruits and vegetables they want at lunch, provided by local orchards and farms. Additionally, physical and mental health is addressed through anti-bullying and harassment lessons, including the Stand Up Club, a student-created group that provides information to students and staff regarding the effects of bullying.

Water conservation, hydrofracking, nature, and agriculture are woven neatly into subjects as diverse as English, art, and technology to create authentic and engaging lessons.

Outdoor exercise opportunities are included in physical education courses, nature-based experiences continue to increase, and ecology, biology, and agriscience courses make use of NCHS' outdoor classroom near a wooded area. Lessons on topics such as water conservation, hydrofracking, nature, and agriculture are woven neatly into subjects as diverse as English, art, and technology to create authentic



and engaging lessons. Furthermore, students in animal and plant biotechnology classes investigate hot-button topics like the genetic engineering done to plants to make them disease- and pest-resistant, reduce the need for chemical pesticides, and make them more productive. Students also investigate water quality, alternate fuels, and oil-eating bacteria through oil-spill simulations.

From the classrooms, to the hallways, to the cafeteria, and the school grounds, NCHS fosters a community of caring, responsible, and environmentally conscious students, preparing them for graduation and the green jobs of tomorrow.

Travilah Elementary School, Potomac, Md.

Out With Trash and Trans Fats; In With Trekkers for Travilah

Located in North Potomac, Md., Travilah Elementary School truly lives by the motto “practice what you preach.” Administrators, teachers, parents, and students all are leaders in the effort to reduce Travilah’s impact on the environment, practice healthy and active living, and integrate environmental education into the life of the school. Students take a leadership role in Travilah’s green practices, health, and growth. The Travilah student government association annually sponsors a Green Day, which encourages peers to write songs, raps, green facts, and riddles to build excitement for conservation. On Green Day, classes engage in stewardship practices, such as cleaning up the school courtyard and playground, taking special nature walks, and brainstorming ways students can help nature stay clean and healthy.

Everyday practices have contributed to a reduction in Travilah’s energy consumption, which previously was recognized by a county award, seven awards from the school district, and one from the Maryland Association for Environmental and Outdoor Education. Teachers and students routinely turn off lights, shut down unused electronics and computers, and close classroom doors, windows, and blinds at the end of the day to save on heating and cooling. Travilah also is committed to recycling and the reduction of waste. The school has adopted environmentally responsible practices, such as copying on both sides of paper and promoting Trash-Free Fridays, where students are encouraged to pack no-trash lunches. Additionally, Travilah has partnered with Whole Foods Market to recycle 225 daily lunch trays, and holds an annual “Drive for Supplies” to repurpose and reuse school supplies.

The school community stays active through the Travilah Trekkers, a group of both students and adults that wear special T-shirts and run laps around the bus circle each morning to stay healthy. The school’s Dolphin Dash and Fun Run also



encourage exercise with 1-mile runs around the school field. The school community is invited to participate in Trivilah Moves Day, an event where the community learns about family wellness activities like yoga, tennis, and karate. In addition to being a USDA Bronze Level HealthierUS School Challenge, the school provides a cafeteria menu that includes grains that are 75 percent whole grains, fat-free and one percent fat milk, and no-trans-fat and low-sodium meals. Students are required to select a fruit or vegetable with each meal.

Environmental education is an essential part of the Trivilah curriculum. In addition to shifting science instruction to an inquiry-based model, the school incorporates STEM concepts. Using the mantra “No Child Left Inside,” Trivilah teachers are encouraged to incorporate the school’s outdoor classrooms, courtyard, and organic gardens into their lesson plans, including decomposition lessons using the school’s composter. Guest speakers are regularly invited to Trivilah to help students make connections to possible careers and practitioners in the field. For example, each year second-graders hear from a nearby farmer, who invites them to his farm to learn about agriculture, healthy eating, canning, growing vegetables, and successful farming practices. Other environmental lessons include third-graders creating a community action project directed at litter and pollution reduction, fourth-graders investigating organic farming practices at the Maryland Historic Agriculture Park, and fifth-graders participating in the Chesapeake Bay Foundation’s “Day at the Bay,” where they collect water samples, study aquatic diversity, dredge for oysters, and analyze data.

Massachusetts

Boston Latin School, Boston, Mass.

Through Education for Sustainability, Youth Can Make a Difference!

Boston Latin School (BLS), founded in 1635, is the oldest public school in the country, and the largest school in the Boston Public School district, serving 2,400 students in grades 7–12. Seven years ago, BLS students founded the Youth Climate Action Network (YouthCAN). It is a very active after-school club that has implemented transformative sustainability initiatives at the school and throughout the community — resulting in powerful youth leadership, sweeping facilities and school-wide curriculum changes, extensive outreach and partnerships, and community service that is unparalleled in the region.

BLS students and staff are working toward education for sustainability – engaging youths in hands-on learning opportunities that build environmental literacy, develop



critical thinking skills, and benefit the community. YouthCAN has conducted sustainability education and outreach in the community, maintaining numerous partnerships with youth organizations, academic institutions, businesses, and public officials in the Greater Boston area. Students organize free sustainability events that serve dozens of schools and organizations in the community every year, including a Climate Summit that brings hundreds of youths together to learn about and take action on issues such as transportation access, water conservation, and food systems.

Outdoor raised vegetable gardens, student-designed rain catchment systems, rooftop weather stations, a SAGE vertical garden in the cafeteria, a rooftop solar array, a state-of-the-art hydroponic vegetable farm, a \$75,000 energy lighting retrofit saving 200,000 kWh of energy per year, and a Lucid real-time building energy dashboard are just a few examples of the hands-on learning components for which students have fundraised and that they have implemented at the school.

In addition to technology and infrastructure improvements, YouthCAN has initiated educational and health programs for teachers and students alike. The school's Farm to School program reaches 2,400 students every Thursday with local food, green bean costumes, promotional t-shirts, and more. The club also has launched a schoolwide "Get Informed" speaker series to raise awareness and improve health. Two sustainability-focused professional-development programs reached 50 educators and resulted in new sustainability lesson plans for schools across Massachusetts. The BLS' Annual Teach-In has tripled student demand for environmental courses, and ensured that sustainability education is incorporated into all grades and across disciplines. In addition, for the past three summers, BLS has helped host and fund the Summer Green Jobs Energy Audit program, resulting in youth-led energy audits at high schools around Boston. In 2012, participants were eligible for energy-saving retrofit funds for their school, which was made possible by an E2 Energy to Educate grant.

Students have presented on local and national broadcasts, including the "Today" show, and manage a website for sharing best practices. BLS students have written dozens of their own grants, and have been successful in raising \$320,000 to fund various sustainability initiatives.

What is unique about BLS is that the students themselves are driving all of this work. Students in YouthCAN manage their own communications and outreach, and, to date, have produced over 65 unique videos. Students have presented on local and national broadcasts, including the "Today" show, and manage a website for sharing



best practices. The students have written dozens of their own grants, and have been successful in raising \$320,000 to fund various sustainability initiatives.

The largest and most ambitious project that the students are leading, with support from alumni, teachers, and the community, is the Rooftop Sustainability Learning Laboratory. This innovative project proposes to build a state-of-the-art community green roof at BLS, where students and educators from across the city — and world — will come to learn how to think in terms of the world's interconnected systems. The project will feature a rooftop garden, outdoor classrooms, and technologies and curriculum to promote STEM learning. The design for this shared facility was created by students who have been working with local architects and engineers for over four years to envision a space where students and educators alike can learn in an exciting facility that — literally — educates by design.

As a result of the dedicated work and creative energy of the YouthCAN student leaders, BLS has received many awards, including the President's Environmental Youth Award, an EPA Merit Award, and the Eco Schools USA's Green Flag Award. BLS won Global Green's 2013 75K Green School Makeover Competition contest. Each makeover element, such as the SAGE garden wall and a Freight Farm, provides deliberate teaching opportunities for the faculty, and student leadership opportunities to manage and maintain the systems. The Green Makeover at BLS represents a critical tipping point in a powerful story of youth leadership and community service. BLS is advancing an important model of education for sustainability that has the potential to affect the rest of Boston's schools and others beyond Boston.

Michigan

Renaissance High School, Clarkston, Mich.

Inspiration from the Outdoors in Every Subject

Clarkston Renaissance High School's (RHS) vision is to integrate green education throughout the curriculum. The goal is for all courses to be taught through the lens of creating environmentally responsible, global citizens, with daily practices reflecting this objective. In fact, during one semester of each year, everything is taught through a sustainability lens.

RHS was the first high school in Michigan to be recognized as a model Project Learning Tree (PLT) GreenSchool. In October 2013, RHS held the first Green Rally to celebrate this success, at which LEED consultants and a DTE Energy



representative gave presentations to students. Current school projects are based on data collected through LEED and PLT investigations. All science teachers are PLT trained. Students study the effect of individual, political, and economic practices on the environment in order to make informed decisions and career choices in the future.

Students in ecology classes decided to replace the school's grass bioswale with a native plant bioswale, which will dramatically reduce water directed to the stormwater system, create a wider variety of habitats through native plantings, and serve as an outdoor multidisciplinary laboratory for all students. The bioswale area will be used to study native flora and fauna, measure project effectiveness, and answer scientific questions. Similarly, to reduce the amount of electricity usage for the soil and hydroponics gardens, a new concept in solar panel development has been added to conceptual physics classes.

Physical education classes use the grounds for outdoor activities as much as possible, encouraging lifelong health and fitness in the outdoors. RHS' spring trimester is devoted to outdoor teambuilding and nature activities. Math classes also use the grounds in various ways, including measuring and making scale representations, performing geometry calculations, collecting data on wildlife, recognizing and categorizing living and non-living things and geological formations, analyzing water at the nearby stream, and following weather conditions. Language arts classes use the outdoors as inspiration for writing.

Daily mini-lessons introduce students to environmental concepts. These lessons include how to use passive solar energy in the building based on the time of day and year, weather, and building orientation. Habits to create a healthy indoor environment and how to decrease the school's carbon footprint are constantly discussed, brainstormed, and implemented. Other classes include: environmental statistics, environmental chemistry and two ecology courses. The school also uses hydroponic and vertical gardens and worm farms to teach sustainability.

Lenawee Intermediate School District TECH Center, Adrian, Mich.

A Living Building for Sustainable Agriculture and Alternative Energy Education

The Lenawee Intermediate School District TECH Center spent over 10 years researching, financing, and ultimately constructing an 8,700 square-foot, net-zero facility with two classrooms, a science lab, a greenhouse, and community meeting space at the LISD TECH Center and its Center for a Sustainable Future (CSF) 75-acre land lab. Students from all around the county attend the school. They all are



transported to a central location from outlying areas. They then board just two buses, which are filled to capacity. This eliminates the need for many partially filled buses to drive to the school.

The TECH Center involved community members, students, staff, and other stakeholders in the vision and design process, which focused on energy efficiency, sustainable principles, and outstanding educational opportunities. The building was constructed to meet LEED Platinum certification specifications. The CSF is insulated beyond energy code requirements. The design includes Solatubes™, a geothermal heat pump, and 68 kW of photovoltaic arrays.

In addition, the building features a green roof that serves as an outdoor classroom, where students currently are studying vegetative and conventional roofs to understand the heat island effect. The CSF roof and other drainage features show students and the community how stormwater runoff can be slowed, filtered, and conserved. Rainwater from the roof is collected in a 10,000-gallon cistern to irrigate garden plots and grounds planted with native grasses. A rain garden and permeable section of sidewalk help recharge groundwater stores.

The TECH Center's environmental health practices include an active Integrated Pest Management program, regularly scheduled preventive maintenance for buildings and equipment, and a certified green cleaning program. The district contracts with a Green Shield-certified company for integrated pest management.

A 10-acre parcel has been set aside for students to learn how to convert conventionally farmed land to certified organically farmed land. Students breed plants, practice growing food on a year-round basis, and learn to extend the growing season using the school's energy-efficient greenhouse during the cold months, all as part of their curriculum. Students are experimenting with vertical growing systems, hydroponics, and aquaponics. They test different varieties of compostable planters for local businesses. The TECH Center school garden supplies food for the cafeteria, as well as for cooking and gardening classes, along with the TECH Center Hospitality and Culinary Arts program, food banks, and other community organizations. At the start of this school year, some of the produce was donated to the Promedica Bixby Hospital Veggie Mobile, and 500 pounds of it were donated to the Salvation Army.

Students raised broiler chickens using free-range practices or fed organic feeds to evaluate differences between conventional and more natural husbandry practices. A vermicomposting system was put in place to recycle food waste from the TECH Center's Culinary Arts program into fertilizer. Last year, a team of students won Gold medals at the state Future Farmers of America competition for their pasture-raised pig project.



Biochemical technology students are working with Michigan State University Extension and Agri-Tech students to grow canola and make biodiesel fuel. Agricultural waste from the site is made into ethanol through students' study of and hands-on work with cellulosic ethanol production. Midwest Energy is partnering with the TECH Center to showcase affordable energy-efficient residential building methods, and Washtenaw Community College and Jackson College are partnering on several sustainability-related projects.

Many courses taught in the district involve agriculture and natural sciences and resources. Career and technical education (CTE) standards have been aligned to Michigan's academic science standards so students can earn science credit for taking CTE courses. Since the TECH Center serves a rural community with many students having a conventional farm background, the district can use science process skills (including mathematics) and technology to compare and contrast sustainable agricultural practices with conventional practices.

Minnesota

Five Hawks Elementary School, Prior Lake, Minn.

A Local Hub of Environmental Education

Five Hawks Elementary School is the birthplace of environmental education in Prior Lake-Savage schools. As a result of Five Hawks' impressive academic performance on tests – and recycling anything that could be recycled -- the district added a seventh principle to its mission statement, ensuring that environmental education would have a permanent place in the school system. Five Hawks staff then conducted districtwide training courses to teach staff at all schools how to incorporate environmental education into everyday learning. Five Hawks is the creator of the districtwide environmental curriculum that is used to deliver instruction in all schools. The curriculum, using the existing Minnesota standards, replaces indoor lessons with outdoor environmental lessons in all subjects.

Not surprisingly, environmental education is a way of life at Five Hawks. First- and fourth-grade teams take sample data at the outdoor learning center to determine the health of the forest and water. The sixth grade examines the dissolved oxygen of the school's stream. Due to building around the pond, the class discovered that oxygen levels had dropped to a dangerously low level. They presented their findings to the city council and the construction team had to change its building requirements. All students are trained to identify trash that cannot be reused, recycled, or composted, recycling-appropriate material, compost material, and reusable material.



Parents often comment about how seriously students take these efforts, as they make sure their families are recycling as well.

The school is fortunate to have a nature center that consists of 33 acres right outside the doors of the classrooms. Within this acreage, there are two prairies, wetlands, a forest, five various types of gardens, an amphitheater, outdoor classroom gazebos, a learning platform, a floating dock, and a fire pit, many connected by approximately two miles of trail. Outdoor classes frequently stop to observe spontaneous events in the outdoors.

More than 50 percent of physical education takes place outdoors. Between scheduled physical education classes, outdoor recess, and environmental activities, students receive more than 120 minutes of supervised physical education per week. Five Hawks has a schoolwide daily snack cart program, which makes healthy choices an easy option for parents. The school birthday party policy prohibits sugary snacks.

Five Hawks has embraced Integrated Pest Management program standards as its protocol, working hard to reduce the chemical footprint. They also conduct an annual survey regarding indoor air quality. The school's multipurpose room has floor-to-ceiling windows, and students are able to enjoy the natural sunlight, as well as watch the birds feed all winter. Natural daylight is available to most classrooms via windows and doors. The building is equipped with an automated energy management system through Siemens for controlling and maintaining a healthy environment while occupied, as well as for efficiency when not occupied.

Five Hawks has used ENERGY STAR Portfolio Manager since 2007. Utilities, including gas, electricity, and water, have been tracked extensively, and an independent firm, Bishop Energy Engineering, has also been used to corroborate the results. For the past three years, the district has participated in the Schools for Energy Efficiency (SEE) program, receiving acknowledgment for Outstanding Achievement in Energy Reduction from SEE for at least 10-percent reduction in overall energy use for 2010, 2011, and 2012. The school has an energy master plan and received ENERGY STAR certification in 2012 with a score of 90, reducing its carbon footprint some 25 percent in six years. Many Minnesota schools have visited Five Hawks, looking to the school for leadership as they move forward with embedding state standards and implementing environmentally based learning in their schools. Five Hawks is proud of the road traveled, looking to continue as vocal stewards of all its natural resources.



Waconia Public School District, Minnesota

Strong Partners for Sustainability and Service

Waconia Public School District (WPS) has been awarded several competitive grants and has received awards for energy conservation, health, waste reduction, recycling, water conservation, stormwater and phosphorus reduction, sustainable facilities and grounds, outdoor education, and environmental sustainability programs across the entire district. Partnerships enable WPS to develop, improve, and sustain programs that reduce environmental impact, promote nutrition and fitness, equip students with environmental literacy, and provide a solid education foundation for students. The goal is that students serve as good stewards of natural resources and pursue careers in environmental-, STEM-, and agricultural-related careers.

WPS is partnering with the Minnesota Board of Water and Soil Resources on a major stormwater collection and reuse project. This project, along with rain gardens and stormwater collection systems currently in place, will result in 100 percent of the district's irrigation needs coming from these sources. It also will contribute to the water quality of adjacent watersheds, and it is estimated that Burandt Lake will be removed from the State Impaired Waters list within five years thanks to this project. WPS high school students engage in water-quality testing, and leaf and road clean-up projects through partnerships with the Volunteer Water/Stream Monitoring Program.

In 2012, the More Than Pink initiative was launched. This program targets girls in grades three through six, and is designed to promote physical fitness, positive self-image, and emotional wellbeing. They participate in a 5-kilometer run to celebrate their completion of the program.

The schools in the district have integrated a comprehensive pest management system to mitigate the use of pesticides, and overall

have reduced the use of pesticides to less than 1/3 ounce per student per year. Pesticides are applied only twice a year and at the minimum recommended amount. The district recently completed a long-term radon detection survey in all of its facilities and found no radon in any rooms or buildings across the entire district. Custodial and maintenance staff regularly engage in mold prevention and mitigation by thoroughly repairing and cleaning leaks, structural barriers, and equipment to reduce condensation and humidity. All classrooms have natural daylight and are equipped with two-stage high-efficiency lighting. All occupied buildings use a filtration and ventilation system with interconnected carbon monoxide monitors and occupancy sensors.



In 2012, the More Than Pink initiative was launched. This program targets girls in grades three through six, and is designed to promote physical fitness, positive self-image, and emotional wellbeing. Girls meet for two hours every day over the course of eight weeks during the summer. They participate in a 5-kilometer run to celebrate their completion of the program. Over 300 high school students are active in the Conservation Club, which engages frequently in physical outdoor activity, and includes both recreational- and environmental-related community service. In high school, family and consumer science courses address healthy nutrition and the energy balance between dietary intake and physical activity.

Environmental concepts at the elementary school level focus on reducing waste and recycling, animal habitats, the water cycle, the life cycle, matter and energy, and air and weather. Both elementary schools within the district partner with the Minnesota Department of Natural Resources and Three Rivers Park District to incorporate lessons related to the designated School Forest. At the middle school level, the Waconia Edible Classroom provides hands-on opportunities for students to learn how food is planted, grown, harvested, and prepared. They develop an awareness of sustainable agriculture and environmentally friendly horticultural practices. Fifteen 10' x 10' Community Garden Plots are made available to the public every summer for a nominal fee of \$20, which supports the Edible Classroom. A portion of the food grown at the classroom is donated to the local food bank.

Grant funding from the Minnesota departments of Education and Agriculture has been used to expand outdoor education, and embed environmental and agricultural science into the core curriculum at both Clearwater Middle School and Waconia High School. Grant funding was used to engage students as ambassadors for social change to promote the "Living Better...Living Green" initiative. WPS contracted with an award-winning media specialist who collaborated with a language arts teacher to engage students enrolled in the video production class to develop and produce a 25-minute newscast on waste reduction. This video was used as part of an education campaign to reduce waste in schools, businesses, and the community. Students participated in all aspects of the production, and the newscast premiered at the local movie theatre to an audience of over 140 parents, students, school staff, local officials, school board members, business owners, and community residents.

WPS recently was awarded the Local Government Innovation Award for integrating service learning as a core requirement. Students work throughout the year planning, raising money, and gathering resources to participate in a capstone service project on the Martin Luther King, Jr. holiday. Many students focus on environmental and sustainable service learning projects. Each year, approximately \$100,000 in cash and goods is collected, and over 10,000 people directly benefit from these projects. Furthermore, students have come to embrace the attitude, knowledge, and skills



needed to engage in collaborative servant leadership to make the world a better place.

Nebraska

Fontenelle Elementary, Omaha, Neb.

No-excuses Fitness

Fontenelle Elementary in Omaha, Neb., engages staff, students, and the community in sustainable, healthy living practices, and this green school community works hard to reduce its impact on the environment. Fontenelle is participating in the Keep America Beautiful Recycle Bowl, competing against other schools around the nation for prizes and recognition based on the weight of the materials collected. A Boltage program has been initiated, which encourages students and staff to walk or bike to school. The program has reduced the number of parents' cars in the parking lot, and the three bike racks now are always full! The number of bike trips a student takes throughout the year is calculated with the help of a solar-paneled device that is located near the bike racks.

Each classroom has a wet/dry vacuum to clean up minor spills, which helps cut down on using large carpet cleaners and thus conserves energy. Each classroom is equipped with reminders to turn off the lights when a class is not in session, and all lights now use energy-efficient bulbs. Paper usage is monitored, encouraging teachers to use technology and other differentiated lessons to reduce the use of natural resources.

Omaha Public Schools (OPS) personnel have been actively implementing Integrated Pest Management program practices in the district's schools for more than 10 years. Fontenelle works to minimize or eliminate major asthma triggers, such as second-hand smoke, pollen and mold spores, dust mites, cockroaches, and animal dander. Every classroom (with one exception) has windows to allow natural light to come in and improve students' mood and productivity. The district received the EPA's National Excellence Award for Indoor Air Quality in 2006 and EPA's Model of Sustained Excellence Award for Indoor Air Quality in 2009.

Fontenelle Elementary has focused heavily on improving the health and wellness of the staff and students, 90 percent of whom are eligible for free- and reduced-price lunch. Purified water is available for the staff to drink, and water is offered at lunch to all students in addition to milk and other healthy lunch items. The school participates in the Grab-n-Go Breakfast program, which has increased the



participation in school breakfast from 325 to over 500 students daily. To further support and encourage health and wellness, a school garden was planted in the courtyard.

Through a partnership with the community, trees were planted in the play area to provide shade during the hot summer months. Also, a space was developed for Tai Chi Chih, a meditative exercise that encourages the students to perform breathing techniques and activities that calm and relax their bodies and minds. Fontenelle is a major participant in the Fuel Up to Play 60 grant program, and funds from the program have been used to buy exercise equipment. A walking club is available to students – with indoor and outdoor walking space -- no excuses allowed! -- and the distance they walk is calculated using pedometers. Fontenelle also received a Project Fit playground through a partnership with Blue Cross and Blue Shield of Nebraska, which is open to the community outside of school hours.

The students engage in hands-on experiences in the garden and learn math, science, and physical education by digging, measuring, cutting, and sawing. Students in all grades learn from the garden. They learn the parts of flowers, about bumble bees, where certain foods come from and how they grow, how a plant grows from a seed, and about plants native to Nebraska. They learn math: Taking the temperature, measuring precipitation with a rain gauge, and determining how deep to plant and how far apart to plant seeds. Students participate in property clean-up days, school garden work, and the planting of trees and shrubs.

A Boltage program has been initiated, which encourages students and staff to walk or bike to school. The three bike racks now are always full! The number of bike trips a student takes throughout the year is calculated with a solar-paneled device that is located near the bike racks.

The students, staff, and community of Fontenelle Elementary all are doing their part to make their little corner of the world more environmentally friendly.

Omaha Public School District, Nebraska

Large District, Large Results

Omaha Public Schools (OPS) is Nebraska's largest school district, is over 150 years old, and serves over 51,000 students, 73 percent of whom are from disadvantaged





backgrounds. OPS has been working to improve its health, wellness, and learning environment while implementing new, innovative initiatives in the areas of environmental and sustainability education. .

In February 2010, OPS created an energy action plan to reduce consumption of energy, water, and other resources. It launched a Green Schools Initiative (GSI) to reduce the consumption of natural resources and embed environmental responsibility in the culture. Each of the 82 schools, 11 alternative programs, and administrative offices participate in the GSI effort. Students collect recycled materials, serve as energy managers, pick up litter, plant trees, and participate in related community events. After three years, OPS has seen positive culture change, dramatically reduced its impact on the environment, and shaved nearly \$2.7 million dollars off of energy costs. It now even has a dedicated staff.

The environmental benefits of this work are exceptional. Energy conservation has kept the equivalent of almost 14,300 metric tons of carbon dioxide out of the atmosphere annually. The average ENERGY STAR Portfolio Manager rating for OPS's 82 schools made an impressive jump from a three-year low of 46 in September 2010 to 61 in July 2013. When comparing the last seven calendar years, 2012 boasts the lowest volume of trash sent to the landfill—a significant accomplishment. Recycling volumes also are at a five-year high. Beyond focusing on building energy, water, and waste, OPS has integrated many other practices to benefit the environment. OPS evaluates bus routes for fuel efficiency and operates over 400 buses on propane autogas. OPS purchases materials containing post-consumer content, has a medication-disposal policy to protect local water quality, and uses smart irrigation and native landscaping.

OPS has made great strides in improving the health, wellness, and safety of the students and staff. Healthy air is a priority and OPS uses the Environmental Protection Agency's (EPA) IAQ Tools for Schools program to monitor indoor air quality (IAQ). OPS was recognized for its program by EPA, receiving a National Excellence Award for IAQ (2006) and a Model of Sustained Excellence Award for IAQ (2009). All pest management professionals employed by OPS are instructed to use Integrated Pest Management program methods, and OPS personnel are among the founding members of the Nebraska Integrated Pest Management Coalition, which has been implementing integrated pest management practices actively for more than 10 years. OPS provides support for the following activities: resolving potential mold problems; managing asbestos; lead testing of paint, soil, and water; cleaning up mercury spills using a special vacuum and two direct-read mercury vapor analyzers; managing chemicals for spills and proper storage; and properly disposing of potentially hazardous materials.





Healthy food options are a priority. OPS has become a member of School Food FOCUS, a national collaborative that leverages the knowledge and procurement power of large school districts to make school meals nationwide more healthful, regionally sourced, and sustainably produced.

OPS provides sustainability education of many kinds, and in certain of its magnet schools provides opportunities for students to explore STEM subjects in a depth available at few schools in the region. Energy, environmental science, research, engineering, biotechnology, and STEM-themed education programs are offered to students at the elementary, middle, and high school levels. Some schools also have developed outdoor classrooms to provide outdoor learning experiences. OPS students learn the connections between environmental science, sustainability, and urban agriculture at every grade level. Ninety-nine percent of the OPS schools are engaged actively in recycling, as students relate recycling to environmental quality for healthy lifestyles. Vegetable gardens, wildlife and native plant habitats, amphitheaters/courtyards, playgrounds, and greenhouses provide hands-on learning opportunities, and allow students to practice multi-disciplinary skills. Teachers also learn to lead their students through multiple grades using proven developmental teaching practices, as well as modeling wellness strategies. In 2013, 42 students submitted 10 entries to the North American Association for Environmental Education, capturing first place in both the long-form and short-form Public Service Announcement categories.

New Jersey

Kellman Brown Academy, Voorhees, N.J.

Bringing Rabbinic Teachings to the Outdoors

Kellman Brown Academy (KBA) is a member of the Schechter Day School Network. Established in 1958, the early childhood through eighth-grade school is founded upon the principle of providing an unparalleled academic experience through integrated general and Judaic curricula. In 2008, the school moved to Voorhees, and the school's board voted to embark on an adaptive reuse concept for the new building. This resulted in turning an empty and outdated warehouse into a beautiful school.

The new KBA was designed following LEED for schools guidelines with building efficiencies in mind including low-flow automatic sinks, glazed concrete blocks of partially recycled materials, renewable linoleum floors, recycled plastics for the bleachers, brand-new HVAC (air and heat) with top SEER rating, energy-efficient



lighting, and many more environmentally smart choices. There was “no shovel in the ground” to renovate the warehouse; only one canopy was added to create a covered side entrance for bus arrival and dismissal. As KBA looked for ways to reduce its environmental footprint, it enhanced classroom light sensors, virtualized servers, and expanded an iPad program for students and faculty.

The school’s board has an ad-hoc committee on sustainability, and supports the green initiatives of the school both with lay participation and by authorizing expenditures through the operating budget. The head of school, Rabbi Moshe Schwartz, developed and manages KBA’s green strategic plan, which contains three main facets: building efficiencies, waste reduction, and expanding curriculum and instruction to develop environmental stewards.

Waste reduction initiatives include: installing hand dryers in all bathrooms, reducing of personal office printers from 10 o’clock to 6 o’clock, requiring every eligible purchase be ENERGY STAR-compliant, eliminating vending machines, replacing Styrofoam products with recyclable paper goods made from post-consumer materials, and using cleaning supplies that are green-seal certified.

Teachers report that the green building initiatives, including location of classrooms, choice of paint colors, and effective use of technology, increase opportunities for differentiated instruction and ensure maximum chances for overall academic success.

Since 2012, Kellman Brown’s curriculum has benefitted from the use of 1:1 student and teacher iPads from fifth through eighth grades. Students and faculty access textbooks, personal planners, data collections, presentation tools, cameras, homework, tests, lab simulations, and other educational websites via technology. While KBA retained textbooks, there has been a significant reduction in paper handouts. Paper communication to parents is limited to once weekly, and has been nearly eliminated through social media and a student-

management software package called RENWEB, which also includes a parent portal for homework, announcements, and directories.

KBA has added a science, technology, engineering, arts, and mathematics program in its lower elementary school that incorporates environmental education. The school sends its middle-grades students each fall to TEVA, a transforming Jewish outdoor education program, to learn about sustainability, ecology, and the environment. Upon return, students lead the way as environmental ambassadors in the school and community. Some of the activities that middle-school students have instituted include enhanced classroom recycling, composting, cleaning the grounds,



and partnering in community service. With the help of gifts from Eric's Nursery and Landscaping, Whole Foods, The Herb Society of America, and the Shore family, KBA built an organic vegetable and herb garden. Students conduct experiments on the soil, study key relationships among natural, energy, and human systems while developing critical-thinking skills for making environmentally-sound decisions. Students also take field trips, most recently to Bartram Gardens and Palmyra Cove.

Kellman Brown's bright new facility has had many positive outcomes for students and staff. Teachers report that the green building initiatives, including location of classrooms, choice of paint colors, and effective use of technology, increase opportunities for differentiated instruction and ensure maximum chances for overall academic success.

To build relationships with the community and emphasize the importance of health and wellness, KBA participates in Jump Rope and Hoops for Heart annually, and partners with the Hazon community-supported agriculture group. This year, the school hosted its first Race for Education, in which the entire student and faculty body – alongside many parents – participated in a walk and jog fundraiser. KBA also partnered with the Philadelphia Eagles on the Fuel Up to Play 60 Challenge. After tracking their progress for four weeks, 25 grand-prize student winners visited Lincoln Financial Field to practice alongside professional football players.

As a Jewish day school, KBA is at the forefront of educating its students and their families about the Jewish values inherent in this philosophy. For example, in fall 2014 it will launch a yearlong curriculum that combines earth science with Rabbinic teachings on the earth, focusing on the Sabbatical year (shmitah), which on the Hebrew calendar will be observed in the land of Israel starting Sept. 24, 2014.

Three Bridges School, Three Bridges, N.J.

Greening the World ... and Adopting a Tiger

Three Bridges School (TBS) has brought sustainable practices to its school community. TBS is dedicated to teaching its students, staff, and parents to reduce their carbon footprint. Its school district's facility manager has committed fully to supporting these conservation efforts by making the building more energy efficient, and purchasing items such as a water bottle filling station, rain barrels, and compost tumblers.

The district partnered with the Society of Environmental Engineers (SEE) to hire an energy efficiency coordinator who works as a liaison between SEE and the schools.



This has resulted in regular data collections on energy usage, more stringent energy-use monitoring, and a new energy conservation policy. In concert with the SEE program, TBS staff and students worked on developing energy-efficient behaviors. Students put signs on computer monitors and printers to remind everyone to shut them off when not in use. Students also attended assemblies with the Energy Hog cartoon character, aimed at increasing students' and teachers' knowledge and awareness of energy conservation.

The maintenance staff ensures that all trash and recycling materials are sorted properly. Students and staff have embraced the recycling effort and remind each other about making good choices when disposing of waste. Students monitor each other in the classroom and the lunchroom, and the student leadership group has created a video about recycling for the school's Web page. These efforts have been so successful that the school needed to upgrade to larger recycling containers.

The school hosted student essay and poster contests on sustainability themes, and presented the essays at a board meeting, where the students performed songs about sustainability. TBS also created the video "One Word," and had each board member write one word associated with conservation and good stewardship. Pictures of each person holding his or her word were gathered in a video and shared on the school's website. The school holds student concerts with green education themes. Students have sung about recycling, sustainability, and preserving the world, and sold reusable shopping bags bearing the school logo at the concession stand, using the money raised to adopt a tiger through the World Wildlife Fund.

At the school bottle filling station, students educate each other as to why they should abandon the single-use bottle, and enjoy watching the count on the fountain increase as it quantifies how many bottles they have saved. Meanwhile, a local organic farmer has shared best practices in gardening with students who have visited his farm, and an on-site school weather station helps teach math, meteorology, and communication skills.

A Girl Scout troop has taken responsibility for watering and weeding the school garden - - even when school is not in session. Parents have shared best practices in composting and growing the school vegetable and herb gardens. Community members -- including a weatherman -- model potential careers in green technologies. Parents have shared their interests and professions in sustainability fields during mini-courses, assemblies, and nature seminars.

Physical education helps teach TBS students how to stay healthy for life. The school has established unique partnerships with the United States Tennis Association and the First Tee programs, securing grant money to provide tennis and golf instruction to students. The nearby Ocean High School students also come to



TBS to teach double-dutch jump roping and healthy behaviors beyond primary school.

TBS is committed to greening the students, staff, and community of Readington Township. Supported by the district's strategic planning goal of continuing its commitment to environmental sustainability, the school will forge ahead in its work and learning in this critical area.

New Mexico

Amy Biehl Community School, Santa Fe, N.M.

Celebrating the Natural Environment and Promoting a Healthy Lifestyle

Amy Biehl Community School (ABCS), opened in August 2010, leads the Santa Fe Public Schools in sustainable design, energy savings, and environmental principles, having received LEED Gold certification in 2013. ABCS also carries the district's highest ENERGY STAR Portfolio Manager score of 98, as well as the lowest energy use intensity of 31.4 kbtu/sq. ft. ABCS also places in the district's highest academic performance ranking. ABCS' conservation mission is twofold: To save energy, celebrate the natural environment, and promote a healthy lifestyle; and create an effective and inspirational learning environment via the integration of the building architecture with the school's curriculum and day-to-day life. Outdoor nature-based learning classrooms celebrate elements of the natural environment, engaging the students with the sun, landscape, flora and fauna, soils, and panoramic mountain views.

Natural daylighting is abundant throughout the school. A ground-source geothermal heat pump system is supplemented by a 74kW solar array, providing a whopping 29 percent of the school's energy generation on site. This photovoltaic system was funded through a community General Obligation Bond, with an Energy Conservation Package specifically targeted towards energy and water use reduction. The school received ENERGY STAR certification in 2012 with a score of 98.

Rainfall is captured by a series of sloped metal roofs and collected into a group of cisterns; the students use the harvested rain in the community garden, sustaining the vegetables that are later consumed and enjoyed in the Cooking with Kids Classroom in which students participate. Possibly the most notable aspect of the school is the abundance of natural daylighting integrated into the classroom environment and the building's architectural form. The design promotes and encourages the use of natural light in every classroom, motivated by studies that find



increased test scores and decreased behavioral problems related to higher levels of natural light.

Artificial lights are automatically dimmed as natural light increases, reducing the heat generated from the electrical lamps. This in turn reduces the demand for cooling and thereby saves operational costs each month while also reducing the building's carbon footprint. The building's construction makes use of a combination of pitched metal and low-sloped roofs as part of the lighting plan. The pitched, standing metal seam roofs allow the introduction of daylight into the interior spaces through clerestory windows in the upper walls. A gray water system was installed to ensure wastewater was reused and/or reclaimed through the community-based wastewater treatment plant. The intention was to bring that gray water back to ABCS' irrigation, though, at present, all gray water is reused throughout the neighborhood before reaching ABCS.

Student-led tours of campus make use of the schools Green Guide, and help introduce visitors to the concepts of environmental design and sustainability. Students are exposed daily to informal and embedded environmental education. An interactive energy and water dashboard in the lobby, linked to a website accessible by all, offers real-time building energy and water data, along with information on a variety of green features, such as the solar panels and a weather station.

An edible garden offers students, 68 percent of whom are eligible for free and reduced-price lunch, the opportunity to explore the process of growing healthy food, demonstrates some of the responsibilities of tending a garden, and enables them to connect with harvesting and cooking the food they grow. It is a challenge to sustain a garden, and the school depends on outside partnerships like Cooking with Kids and EarthCare to offer curriculum and support. The local Audubon chapter partners with Amy Biehl staff to offer every student experiences around some aspect of ecology and the natural environment. The local Wild Birds Unlimited helps support a bird sanctuary in one of the outdoor classroom spaces, attracting wildlife and many bird species from the area. Teaching a respect for nature and oneself is a common thread throughout these programs.



North Carolina

Exploris Middle School, Raleigh, N.C.

Solving Current -- and Future -- Problems Around the World

Exploris Middle School is a model global-education school in North Carolina. Exploris' articulation of its core values ground the school in its approach to education. These are: Curiosity, Reflection, Craftsmanship, Engagement, Collaboration, Relationships, Connections to Nature, Social Empowerment, Innovation, and Balance.

In Exploris' 16-year history, the school has been particularly interested in reducing

A nationally normed assessment, Measures of Academic Progress (MAP) for the 2012-2013 school year revealed Exploris students not only to be outperforming their national grade-level peers, but also to have higher combined growth averages in all three subject areas tested (reading, mathematics, and language usage).

its environmental impact. Exploris used EPA's ENERGY STAR Portfolio Manager to calculate a 25 percent reduction in its greenhouse gas emissions. Trash has been reduced to about one bag per grade level through color-coded recycling bins, which include TerraCycle containers. In collaboration with the school's landlords, an electrical timer was installed so that lights and the computer network automatically turn off during non-working hours. Additionally, new plumbing was installed in 2009 to prevent lead from being in the school's drinking water, and a new white roof was installed in 2010 to help limit heat absorption in the building and the need for air conditioning during warmer months. Based

on analysis of the water invoices since moving into the current building, Exploris has reduced domestic water usage by 19 percent, and has no irrigation water usage.

Exploris is dedicated to improving the health of its school's students and staff. The school's cleaning service cleans late at night, and stores no cleaning products at the school. If a pesticide must be used in the building, it is done after school hours to limit staff and student exposure to it. The school participates in numerous health and wellness programs, including the USDA's Healthier US School Challenge and a Farm to School program. Exploris also has an on-site vertical food garden, which supplies food to the community. The school's students spend at least 120 minutes per week in supervised physical education, and at least 50 percent of the students' annual physical education takes place outdoors.



Exploris uses an interdisciplinary, project-based curriculum. In alignment with the school's core values, the bulk of each grade-level's work centers on issues of environmental sustainability and STEM pathways. Teachers frame instruction around current, complex issues, which serve as a compelling lens for covering the curriculum standards. Guiding questions, two to three case studies, hands-on project work, and a culminating, public event serve to further engage students. Each student completes research, collaborates on group projects focusing on elements of design, and has access to primary documents and local experts, including former North Carolina Governor James Hunt, the staff of North Carolina Museum of Natural Sciences, and the staff of Raleigh City Farms. Students are regular presenters at regional conferences, such as the North American Association of Environmental Educators, the North Carolina Service Learning Coalition, and the North Carolina Scaling STEM Conference.

By tackling current issues and working with experts to brainstorm solutions, students feel like they have something to offer the world. Two examples that highlight Exploris' approach to curriculum design are projects that grew out of multiple community partnerships. As part of an eighth-grade study of water, student teams investigated environmental issues in the Neuse River basin and used the Earth Force curriculum to create action projects. Another team built a network of public partnerships to create a citywide anti-litter campaign. The students worked with Raleigh's public affairs department to film multiple public service announcement videos for local cable TV. They partnered with a local design firm to create a bus advertising campaign, and lobbied the Raleigh City Council to install additional cigarette-butt receptacles at city parks and transit stations. The students launched their campaign at the Walnut Creek Wetland Center to highlight the connection between litter prevention and clean water. Projects like these contribute to Exploris' success in creating independent learners, and critical and creative thinkers who are active and dedicated to environmental sustainability.

The school participates in Outward Bound, Lego Robotics, Odyssey of the Mind, Science Olympiad, and Bridge Building. Students track Eastern Box Turtles and collect data on their feeding, growth, hibernating, and nesting. Each spring the students analyze data to pursue their research questions. Sixth-graders prepare their turtle-tracking data for a video conference with a school in Alaska. Seventh-graders use rubrics to polish their issues-based STEM projects about food, which will be displayed in N.C. State University's heavily traveled "brickyard" on World Food Day. Eighth-graders prototyped, ideated, and innovated, and were paid off by taking the top three design prizes for the 2012 Water Tower Competition.

Currently sixth-graders are studying materials science with the Dow Chemical Company. They are using concepts in biomimicry to identify examples where the natural world minimizes or maximizes heat transfer. The students will interview





professionals that design, manufacture, or build these materials before designing windows, walls, rooftops, and floors for a future school. This energy study will later be extended when the same students profile their home's energy efficiency in eighth grade. This study focuses on issues around renewable and nonrenewable energy, including careers through the Harris Nuclear Plant, NC Solar House, NC Biofuel Center, Duke Energy Envision Center, and CREE a North Carolina-based LED company.

Ohio

Milton-Union PK-12 School, West Milton, Ohio

A New LEED Gold Construction Results in Real Learning

The Milton-Union PK-12 school was recognized by the U.S. Department of Education's National Center for Educational Statistics and the New American Foundation's Federal Education Budget as top in the state for highest achievement and lowest costs. Throughout the evaluation, Milton-Union was in the top third of all Ohio schools for achievement and in the bottom third for spending. The Milton-Union Elementary School has been recognized as a National School of Excellence, while both it and Milton-Union Middle School have attained School of Promise status. The School of Promise recognizes schools attaining solid student achievement in reading and mathematics while serving a significant number of economically disadvantaged students.

Milton-Union maintains high educational achievement ratings, and the school's commitment to energy efficiency and environmental sustainability plays an integral role in keeping costs low. In 2012, Milton-Union replaced old and energy-inefficient buildings with a new combined prekindergarten through 12th grade building. The new building incorporates state-of-the-art environmental system controls and features enhancements to the building envelope for energy efficiency. The new school was awarded LEED Gold certification in 2013.

Energy efficiency and sustainability were at the heart of the building efforts. As a result, energy costs are 36 percent below those expected for a building of similar size. As of October 2013, measured energy costs were \$0.90 per square foot, compared to an average of \$1.40 per square foot for similar buildings. The building's rainwater-harvesting system is resulting in approximately 35 percent savings in water cost. From the beginning of the project, the goal was for the building not only to be energy efficient, but also a learning tool for sustainability for students, staff, and community.



The building site is an important resource to the community, with an abundance of natural green spaces that provide an array of teaching opportunities. The site is 130 acres, and was donated to the district in 1973. Of the total area, 44.2 acres are wooded, 8 acres are a former tree farm, 11.7 acres are former fields that have been converted to open prairie, and 2.8 acres are a new detention area and bioswale. In addition, 3.7 acres are dedicated to a park with picnic shelters and open space. The building itself occupies 14 acres. This includes approximately 6.2 acres of paved areas and 3.6 acres of playground, landscaped areas and rain gardens. The remaining 45.4 acres of the site are sports fields. New plantings of water-efficient, native species were included as part of the construction project.

From improved air quality to contaminant controls, the benefits of the building design help to improve the health and safety of students and staff members. Key features, such as rain gardens and a wind turbine, offer unique ecological education opportunities. In fact, the number of renewable energy systems installed at the school provides students direct exposure to a variety of sustainable strategies ranging from solar thermal, photovoltaic solar panels, rainwater harvesting and real-time monitoring of energy use.

A required Earth Science curriculum includes studying the solar thermal system that pre-heats water which offsets the use of natural gas, the impact that a “green” roof makes by absorbing rainwater while filtering dirt/minerals through its roots, the effects of window solar shades related to daylighting and reducing cooling loads, the energy produced by the on-site wind turbine and photovoltaic solar array, the rainwater collection system and the importance of water conservation, rain gardens and bioswales and the importance of protecting water shed areas, and the energy saved by maximizing natural lighting and using photometric sensors to turn off lights in unoccupied areas. Other programs include an elementary school rainforest unit and high school biodiversity unit, a STEM curriculum including the Envirothon competition, and special programs with the Master Gardeners, Park District and Miami Soil and Water Conservation District.

Metro Catholic School, Cleveland, Ohio

Truth and Environmental Justice for All

Twenty-six years ago, three urban Cleveland parish schools joined as one to form Metro Catholic School. The goal was to create a fiscally sound school that would be available for all urban children, regardless of religion or ethnicity. From this outset, this school has provided cutting-edge educational programs along with a focus on



justice issues, especially the environment, now serving 80 percent of students below the poverty line.

The school of 550 preschool through eighth grade students operates out of three buildings that previously were part of the individual parishes. Each building was built in the late 19th or early 20th century, so bringing them up to date environmentally has been most challenging. However, over its 26-year history, the school has continued to move forward in teaching and modeling environmentally sound principles. The 2008 renovation of a classroom resulted in a model LEED classroom for the students and teachers to become familiar with LEED principles. In addition, during the 2013 renovation of a men's lavatory, Metro took the first steps toward designing all the school lavatories to use water and energy saving devices.

School and community garden projects begun in the 2002-2003 school year for the school's 15th anniversary, and as an antidote to violence in the lives of the students, are ongoing to this day. A junior garden club has been created with a partner adult garden club to maintain the campus through the summer. St. Stephen Parish has built a greenhouse on the school property, and offers education sessions for the neighborhood and students of the school on Saturdays throughout the year. The school boasts a green space as a result of partnership with Detroit Shoreway Community Development Corporation and Cuyahoga Land Bank. The space includes a learning garden, an outdoor stage, raised growing beds, rain barrels, permaculture, a meadow, and a wildlife habitat, along with an outdoor classroom, which is used for instruction and engagement in earth literacy and STEM projects.

Recycling is implemented in all three buildings, and the building housing the preschool through first grade classrooms recently began a program that will bring awareness of how many trees are saved through this process.

Metro has cultivated partnerships with Cleveland EcoVillage, Cleveland Botanical Garden Center, local urban gardens, and local food providers. In addition, the school provides staff with training through Earth Partnership for Schools, Great Lakes; two teachers now have expertise focusing on bioregion and project-based restoration and sustainability.

West Geauga High School, Chesterland, Ohio

Leading Teachers, a Leading School

Since West Geauga High School began its energy conservation program roughly five years ago, the efforts of energy coordinator Wes Rogge, a social studies



teacher, have saved nearly 6 million kW of electricity, as well as over 28,000 cubic feet of natural gas. West Geauga has avoided producing nearly 7 million metric tons of CO₂, and has provided the district a savings in utility costs of well over \$1,000,000. Through recycling and composting programs managed by student groups, thousands of pounds of solid waste have been diverted from landfills. These tremendous milestone efforts are being realized by educating people about environmentally responsible behaviors, not with new technology, new infrastructure, or construction.

West Geauga has avoided producing nearly 7 million metric tons of CO₂, and has provided the district a savings in utility costs of well over \$1 million.

Mike Sustin, the environmental science teacher at West Geauga High School, strives for professional growth and to provide leadership. He has been recognized as the North American Association for Environmental Education's Teacher of the Year. He is on teacher advisory boards for both the Geauga Park District and the Lake Metroparks, and is involved in program development and alignment. He recently was recognized by Project Learning Tree-Ohio as Teacher of the Year, and has been awarded a seat on the Project Learning Tree-Ohio Board of Directors. He conducts professional development workshops for the popular Project WILD, Growing Up Wild, Project WET, and Project Learning Tree curriculum supplements for teachers, as well as undergraduates in teacher training programs. He runs an award winning Summer Ecology Expedition program for high school students to earn credits on their official transcripts for in depth field studies in ecology, conservation biology, geology, and environmental science.

Energy savings are an ongoing pursuit at West Geauga High School. Recently, all of the overhead lighting in the two gymnasiums was changed from the old sodium vapor lamps to new 80W high power compact fluorescent lights. The lights are brighter, energy consumption is down, and the new bulbs will last longer.

West Geauga partners with agencies like the Ohio Department of Natural Resources, the Cleveland Museum of Natural History, Holden Arboretum, Lake (county) Metroparks, Geauga Park District, Cleveland Metroparks, Geauga SWCD, Ohio Vernal Pool Partnership, Western Reserve Land Conservancy, Case Western Reserve University, local landscape companies and nurseries, Brownies, Cub Scouts, and Boy Scouts, as well as Russell, Chester, and Munson Township governments in order to accomplish environmental goals. Each of these partners provides material goods or services, as well as access to some of the best, brightest and creative minds in the business of becoming green. Without these partnerships, student initiatives like rain gardens, Salamander Education and Environmental Diversity (SEED) Trail, diesel particulate filters for all school buses, idle-free zones



at all school buildings, plastic and aluminum-can recycling programs and kitchen waste composting program would not have become integral parts of daily life at West Geauga.

Schools are always looking to do more with less. Continued development of the Summer Ecology Expeditions program will provide deeply meaningful field experiences for students, through expeditions in Ohio, Wyoming and Costa Rica. After-school clubs have proven to be effective outlets for students to explore their own efficacy. Key Club handles the paper recycling program, and Interact Club provides opportunities for volunteerism and service learning at the county park districts and at childcare and eldercare facilities. The Envirothon academic competition team has been a platform from which students have developed the appreciation, knowledge, and passion for the environment that has led them into environmental career paths at college. The school's Lexus Eco Challenge teams have been consistent first place winners with projects locally and globally, including installing composting toilets in Afghanistan.

Oregon

Jesuit High School, Portland, Ore.

A Theology of Sustainability

Jesuit High School's 17,281-square-foot Elorriaga Center is environmentally responsible in construction, usage, and maintenance. It features low-flow fixtures, solar panels, efficient lighting, environmentally friendly building materials, and a night-flush system instead of air conditioning. Additional green features make the building a living, breathing extension of sustainability.

In 2011, Jesuit received recognition as an Oregon Green School. In 2012, Jesuit received a grant from the Coca-Cola Foundation for 15 recycling bins designed specifically for placement in the cafeteria and on athletic fields. In 2012 and 2013, the Oregon Department of Education recognized Jesuit in the Oregon Sustainable Schools Award.

In fall 2013 the school introduced an AP environmental science course in which students design self-sustaining ecosystems in an EcoColumn and analyze the interconnectedness of habitats. Jesuit's international studies class holds a Climate Conference during its climate change unit, in which students research a particular country's relationship with climate change. Additionally, Jesuit has an active student-led Green Team Club, responsible for organizing, promoting, and educating





the community about schoolwide recycling efforts. In 2013, Jesuit formed a Global Engagement Committee to enhance students' global and environmental awareness, and connect with schools in the developing world.

Jesuit's theology program closely examines social sustainability issues and deeply connects with the Christian service program, in which all students complete at least 65 hours of sustained community service with underprivileged people. Each year, 94 percent of Jesuit's student body attends weekend retreats that take place in the outdoors and allow students to reflect on the environment as a manifestation of God's creation. Some 900 students take health and/or physical education classes, and over 700 participate in athletics, developing lifelong healthy habits.

Jesuit also recently completed an extensive audit of the school's energy use, custodial and maintenance practices, and student and staff behavior. The school derives nine percent of its energy from renewable sources, including solar panels on the school roof and a renewable power mix from the utility provider. An additional 17 percent is derived from hydroelectric power via the local utility company. Jesuit uses cleaning products that are 98 percent certified sustainable, and maintains a large bioswale filtering surface water runoff from parking lots and sidewalks. In December 2013, Jesuit purchased six "No Idling: Young Lungs at Work" signs, now visible in the school's parking lots.

The school's partnerships with community organizations are diverse. In November 2012, four staff and 25 students traveled to Washington, D.C. to the Ignatian Teach-in for Justice to learn about civic engagement and attend sessions on climate change, recycling, fracking, and environmental justice. Jesuit also has very healthy partnerships with local experts in sustainability, including the recycling liaison for the Beaverton mayor's office. Through the school's Christian service, campus ministry and adult formation programs, Jesuit has high-quality partnerships with organizations such as Blanchet House, which provides meals to the homeless; the Oregon Food Bank' Migrant Head Start of Hillsboro; and the Jesuit Volunteer Corps. These local partnerships are integral to Jesuit's mission to educate men and women for others, and share its mission of sustainability.

Willamette High School, Eugene, Ore.

Sustainability in All Elements

Willamette High School (WHS) recycles over 2,000 pounds of material every week, which is a 48 percent increase from 2010. Each year, WHS partners with two local nonprofits – NextStep Recycling, an electronics recycler, and St. Vincent de Paul, a



human-services organization, for its annual Recycling Roundup. In 2013, WHS students accepted more than nine tons of electronics that were recycled at NextStep, as well as clothes, toys, appliances, mattresses, and Styrofoam that were sold or recycled through the St. Vincent de Paul thrift shop. WHS makes conscious purchasing decisions by using paper towels that are EPA certified 85 percent post-consumer waste, toilet paper that is 35 percent postconsumer waste, and plastic garbage liners that are at least 25 percent post-consumer waste.

WHS is Bethel School District's largest campus, and is a district leader in new facility management approaches, including the use of automatic light sensors, a policy to turn off lights, end-of-day reminders to shut down electronics, programmable controls to regulate classroom temperatures, and weekend/vacation HVAC shutdown procedures. The energy management plan includes monthly use-monitoring and assessment through Oregon's Cool Schools Program.

Sustainability is part of the school's DNA, and is realized through health, wellness, and physical activity efforts. WHS' kitchen is identified as a national leader in using fresh, locally grown foods in school meals, with recognition from the National School Nutrition Association, *Today's Dietician* magazine, and School Meals That Rock. The school district purchases 35 percent of food from farms and ranches located within a 100-mile radius of the Willamette Valley; a higher percentage than any other school district in the county. This year, WHS joined Eugene's Love Food Not Waste (LFNW) commercial compost program, in which kitchen food scraps are composted locally and resold as a retail compost product. WHS currently is piloting the program, with the intent to roll it out districtwide in 2015.

A sizable outdoor school garden features more than two dozen large, raised beds that serve as skills training for students. With assistance from local business partners, students operate aquaponic and aeroponic gardens, as well as a self-contained indoor hydroponic garden that provides starts for vegetables and herbs. School buses follow a no-idling policy that minimizes diesel emissions and maximizes air quality for students. WHS also participates in the district's Safe Route to Schools program, which increases student walking and biking opportunities. The combination of district programs and a long-term partnership with the City of Eugene's Peterson Barn Recreation Center provides students with quality recreation and sports programming to maintain a healthy mind/body balance.

An array of civic engagement classes with hands-on learning components boosts individual development and team-building skills. These classes range from the Willamette Improvement Team, which beautifies the school campus and creates a safe environment, to an Electrathon class, where students build electric go-cart sized cars and compete in races around the Pacific Northwest. 2014 has brought the construction of a new science wing. The additional space will provide an



opportunity to raise the level of integrated sustainability education for students. WHS is cultivating public and private partnerships to develop a STEM program through a regional cooperative that includes the Lane Education Service District and the University of Oregon. Further sustainability education efforts are supported by community partnerships with a wide variety of public, private, and nonprofit agencies.

Pennsylvania

Council Rock School District, Pennsylvania

Think Globally, Act Locally: Greening Council Rock and Making an Environmental Difference

Think globally. Act locally. These two short phrases have forged Council Rock School District (CRSD)'s partnership with local community members and businesses to promote environmental acuity, responsibility, and sustainability.

Nearly a decade ago, CRSD solidified that partnership through the creation of its first Green Team, an interdisciplinary endeavor involving stakeholders from every walk of life, the sole purpose of which was to seek out opportunities to improve the health and well-being of its schools, staff, students, and community. Now, not only is there a CRSD Green Team, but there is a Green Team in each of its 15 schools as well. Thus, local actions have improved the well-being of one small portion of the planet. This is how a grassroots phenomenon begins.

CRSD's administration has not merely accepted this greening process, it has embraced it. The time it takes to foster creative green thinking has become part of the district's daily routine rather than an occasional occurrence. Students, teachers, community members, administrators, and other district employees are afforded the time—and funding—it takes to regularly meet to identify sources of waste and then brainstorm solutions. Since 2000, green initiatives have led to avoiding millions of dollars in costs through energy management. CRSD's ENERGY STAR rating is 84. By engaging with the community and working with Aramark Energy Solutions, CRSD has posted a reduction in energy bills of \$9.5 million.

Meanwhile, wellness programs and personal nutrition studies promote healthy lifestyle choices for staff and students, ensuring that the community will have responsible decision makers when the time comes for them to take the reins. CRSD's environmental plan incorporates a wide variety of environmental initiatives to further improve the health and wellness of students and staff. These include, but



are not limited to, integrated pest management, air quality improvement, moisture control, and chemical management.

In CRSD's classrooms, environmental and sustainability education thrives, creating opportunities for all. Inquiry-based STEM instruction is enriched through the participation of professionals well-versed in the nuances of environmental education, cutting across academic levels of learning and subject matter, from kindergarten through high school graduation. K-12 science curricula foster environmental literacy and watershed preservation. Primary grades study ecosystems and conservation; elementary school students plant their own organic garden, donating its harvest to local homeless shelters; and high school students discuss the effect of pollution on their view of the night sky with astronauts at the International Space Station annually. Two Council Rock High School South teachers have joined the NASA Network of Educator Astronaut Teachers, making it the only school in the nation to receive this honor twice. Sustainability education is not limited to STEM classes at the school. The art department received an award from Newtown Borough for making recycling the focus of the annual district art show.

The effort reaches well beyond the school day and even the school year. A summer program, Camp Invention, immerses elementary school students in hands-on activities that connect

By engaging with the community and working with Aramark Energy Solutions, CRSD has posted a reduction in energy bills of \$9.5 million.

science, technology, engineering, and green innovation with recycled materials, while earning older students service-learning credits as they mentor younger ones. The annual District Science Night engages students, professionals, and senior citizens, delivering inquiry-based instruction. Twenty unique instructional opportunities are offered to Science Night visitors in STEM topics, including environmental science, wildlife habitats, energy, astronomy, chemistry, and microbiology. CRSD also participates in programs that actively promote environmental literacy, such as the Pennsylvania Junior Academy of Science Annual Competition, which culminates with a competition at Pennsylvania State University. CRSD consistently places more than 30 students in the top rankings of this 7th–12th-grade statewide event. CRSD students also apply knowledge of STEM content through extracurricular activities such as STEM Club, Botany Club, Trout in the Classroom, and the Environmental Action Clubs. Council Rock has partnered with the Dow Chemical Company's You Be the Chemist program, Lockheed-Martin's Engineering Career Day, among others.

CRSD's concerted efforts will continue to drive innovative curriculum development, inspire educational leadership, build healthy community relations, and foster conservation and stewardship within the district and beyond for decades to come.



These are the endeavors of a community of learners—not just of students or staff in a school district—all of whom are committed to lifelong environmental education, a passion with which CRSD forges its future. It is a passion with roots sown locally and branches grown globally.

Rhode Island

Claiborne Pell Elementary School, Newport, R.I.

Honoring an Environmental Leader by Cultivating a Commitment to Sustainability

Each student at Claiborne Pell Elementary School has an opportunity to create and experience a healthier environment by developing skills in the management of natural resources and an understanding of a commitment to a sustainable future. Pell has implemented the School as a Tool Rhode Island Sustainable Schools Protocol Agreement. The school has established a Green Team consisting of many in-house stakeholders and community members. Pell also has conducted an environmental survey of student's staff and parents. Most importantly, the school has integrated environmental literacy into the curriculum.

Pell School is a model of sustainable design. The school building is positioned to maximize the number of north- and south-facing windows to control the light in the building. Large windows and skylights located throughout the school provide abundant views to the outdoors. Interior light shelves are provided near the top of windows to reduce reliance on window shades. These shelves reflect the sunlight so it penetrates deep into each room and bounce this natural light off the reflective sloped ceiling tiles, triggering the daylighting sensors to save electricity consumption.

Reflective material on the roofs helps to reduce "heat island" effect. Grill systems at all entrances are designed to eliminate soil from entering the school, reducing the need for excessive wax recoating of the flooring. The school is cooled and partially heated with a quiet low-velocity-displacement ventilation system. The five rooftop units take in outside air, which is filtered, dehumidified, heated, and delivered to each classroom space and common area through perforated displacement grills. In the first-floor administration area, fresh air is supplied under a raised floor through adjustable diffusers. Because the air brought in from the outside is dehumidified, there is no opportunity for mold to grow. Building occupants experience a dry, comfortable environment.



All toilet rooms have low-flow faucets, and toilet flushing is accomplished with automatic sensors. The 12 preschool and kindergarten classrooms are equipped with dual flush controls. These green design features reduce the amount of water used with every flush and every hand washing.

Environmental and sustainability assessments are integrated into the Pell Science curriculum. Teachers use a variety of formative assessments through science inquiry and science notebooks to measure student learning of environmental and sustainability concepts. All students have the opportunity to explore their science studies beyond the classroom walls. For example, they explore insect life and learn about the different friendly insects that feed their community gardens. Older grades investigate electricity and energy conservation.

An important piece of the mission of Pell is to create an outside environmental classroom. Pell is creating community gardens and a children's arboretum on the school grounds. The raised garden beds will have a section for every class to prepare, plant, and harvest their crops. The Newport Tree Society is partnering with the local tree warden to establish a children's arboretum. Additionally, an afterschool garden club consisting of Pell students will prepare and taste healthy snacks from ingredients grown in the garden. Pell School participates in the local fruit and vegetable snack program in order to promote students' sampling a variety of foods to incorporate into their daily diet.

Sustainable education cannot be taught without proper exercise and recreation. Pell students, 62 percent of whom are eligible for free and reduced-price lunch, participate in FitnessGram, and physical education at Pell takes place outside all year, weather permitting. The school offers a fully equipped gymnasium, a soccer field, and two school play yards. The school ensures good environmental health by meeting appropriate indoor air quality and radon monitoring standards, using green cleaning products, and having an Integrated Pest Management program.

In 1987, Rhode Island Sen. Claiborne Pell, for whom the school was named, was honored as one of the inaugural class of the United Nations Environmental Programme Global 500 Roll of Honour winners. These award recipients were described as pioneers of a broad and growing environmental movement that was flourishing around the world. Senator Pell would be truly inspired by the sustainable accomplishments taking place at this educational facility named in his honor.



The Greene School, Greenwich, R.I.

Expeditionary Learning That Lives Up to Its Green(e) Name

The Greene School (TGS) is a public charter high school and Rhode Island's only Expeditionary Learning School, serving a diverse demographic of students across 19 school districts. Through the context of local and global challenges, TGS meets its mission of developing 21st-century systems thinkers by immersion in a culture of environmental stewardship and social responsibility. TGS believes in engaging directly students with real-world academic tasks.

Developing environmental literacy is the heart of TGS. Teachers deliver the majority of curriculum through critical environmental topics of the 21st century: energy, food, waste, biodiversity, genetics, and sustainable development. Through multidisciplinary units called Learning Expeditions, students delve into understanding the complexity of environmental challenges as they consider solutions from diverse perspectives. Each Expedition is a carefully designed series of student-centered experiences. Students transition from building background knowledge to learning academic and technical skills from experts in the field. For example, during the ninth-grade Energy Expedition, students analyze the trade-offs of various energy production methods by visiting a nuclear reactor at the University of Rhode Island, a for-profit trash-to-energy facility, and the Aperia Center for Sustainable Living. This Learning Expedition culminates with students conducting an energy audit and making energy conservation plans for the school.

Each Expedition topic culminates in a final product for a real and authentic audience. The final product for the Food Expedition is the annual 100-Mile-Radius Dinner. During this event, which features a meal created from seasonally appropriate local foods, ninth-grade students entertain guests by presenting projects created while learning about food and sustainability. The projects exhibited at the last year's event included life-changing personal food manifestos, scientific reports about the soil health of local farms, and student-built solar cookers.

Crew, another aspect of student life at TGS, is an advisory-like structure that promotes wellness and connection to the natural world. At the start of every school year, students participate in an overnight outdoor experience with their Crews called Wilderness. Students hike, prepare meals, and complete service work in local Department of Environmental Management Areas. As students progress through grade levels, the experience gets more challenging. The Wilderness experience consistently is a transformational experience for students inter- and intra-personally, and develops their connection to the natural world.



Throughout the past four years the stakeholders of TGS have worked collaboratively to create rituals and traditions that support the school's environmental mission. One ritual is the annual Earth Week celebration organized by the TGS Board of Directors. During the week, students speak with various environmental leaders and participate in rich off-campus service learning activities. In 2013, students were thrilled to have the opportunity to hear from Jack Groh, director of the National Football League's Environmental Program. TGS also has several clubs, including Envirothon and the Green Team, that promote civic engagement in environmental issues. Perhaps the most powerful tradition implemented is the Senior Project. All senior projects, from authentic research projects to community service and media projects, must connect to at least one pillar of the school's environmental mission statement.

Last year the school upgraded to 18-watt LED bulbs, which decreased energy consumption by approximately 6.3 percent. This year TGS has reduced energy consumption by shifting away from desktop computers. Students now use a mix of ultra-low-power and ENERGY STAR certified laptops. TGS also is using fewer appliances. A policy change has diminished the need for microwave ovens by 50 percent in one year, greatly reducing energy consumption.

In 2011, the school installed a 507-panel rooftop solar array through a partnership with Green Mountain Power and the office of Senator Bernie Sanders. This array produces a savings of \$25,000 each year, and covers approximately 25 percent of the school's electric costs.

TGS remains focused on a goal of building a green campus at the University of Rhode Island's W. Alton Jones campus in West Greenwich. In 2013, the school partnered with ROB Architects to develop a master plan for the first phase of construction, the Sustainable Learning Center. The integration of sustainable design, building operations, and curriculum will complement the established tradition and culture of the Greene School. Having a campus integrated as a teaching tool is a major goal. The schematic design highlights rainwater harvesting for use, storage, and analysis. Inclusion of photovoltaic and other green technology in a flexible plan is intended. The objective is to include hands-on teaching opportunities wherever possible throughout the campus, and to allow students to learn real world science skills to become environmentally literate citizens for the 21st century.



Vermont

Camels Hump Middle School, Richmond, Vt.

Learning on Research Vessels, Farms, Shore Preserves and Wildlife Refuges

Camels Hump Middle School focuses on creating and maintaining a sustainable and healthy school for students and staff. Camels Hump has made great gains in ensuring an efficient school with healthy air quality, thermal comfort and well-designed lighting while drastically reducing the cost to provide these services. The school actively promotes and practices a rich education that focuses on the environment, renewable energy, nutrition and wellness. Camels Hump benefits from successful partnerships to collaboratively engage students in the environment, health, and education. Students can be found on Lake Champlain research vessels, and local farms, and well as in river shore preserves, wildlife refuges and granite quarries, where they receive effective hands-on environmental education.

Students participate in many field experiences as a part of the curriculum, including investigations of the Lake Champlain Basin Watershed, research on a flood plain forest, a river shore preserve, an ecological trip to the Northeast Kingdom focused on migration and tracking, and trips to local geology sites and numerous local farms. Students continue to have experiences at the Audubon Center, Green Mountain Composting, the Chittenden Solid Waste District, and the Vermont Youth Conservation Corps Monitor Barn. Sustainability partnerships include a longstanding partnership with the Vermont Reptile and Amphibian Atlas project, where students collect data for statewide research. While using the environment as a learning platform, students track the migration of amphibians and analyze the effect of humans on the population. Students also participate in amphibian crossing events during the night in the spring to record spring breeding migration data. As members of a rural community with significant farmland, students study effective nutrient management strategies that lessen the environmental impact of farm runoff into the Winooski River and Lake Champlain basin.

Camels Hump's alternative energy and conservation practices are widespread and varied throughout the facility. In 2011, the school installed a 507-panel rooftop solar array through a partnership with Green Mountain Power and the office of Senator Bernie Sanders. This array produces a savings of \$25,000 each year, and covers approximately 25 percent of the school's electric costs. Camels Hump heats the building primarily through a biomass heating unit that uses wood chips. Comparable fossil fuel cost would be \$72,000 per year; Camels Hump uses approximately \$27,000 in wood chips each year. In addition, revamping electrical needs and lights have resulted in reduction from 681,000 kW / year to 215,000 kW / year usage. Students learn daily about the energy savings from the solar array through kiosks in



the building, which show in real time how many kilowatts are being produced, and the energy saved compared to a gallon of gasoline. Students also see over time the total number of pounds of sulfur oxide offset.

Student wellness at Camels Hump is a focus not only of projects and initiatives, but of everyday activities that keep staff, students, and families healthy. There are a variety of activities in which students can participate, and during the cold Vermont winter, Camels Hump maintains an outdoor ice skating rink with an ample supply of skates. Camels Hump actively identifies families in need, and attempts to supplement available resources for families with items such as “break boxes” to ensure students have adequate nutrition while school is not in session.

The food service director at Camels Hump focuses on nutritional and seasonal recipes, and actively works with the Vermont Food Education Every Day program. The food program focuses on the Vermont Harvest calendar, scratch cooking, and ways to make local food affordable. Students participate in the school garden, use the garden to make food in health and nutrition classes, and assist in harvesting food to be served in the cafeteria. Also, students compost all food in the cafeteria and learn how to separate food for effective composting for the environment.

Camels Hump Middle School in Richmond, Vermont is an amazing place to work, grow, and learn. Camels Hump instills in students a lifelong practice of health, productivity, and green practices.

Champlain Valley Union High School, Hinesburg, Vt.

Students EnACTing Behavioral Change for Conservation Buildingwide

In November, Champlain Valley Union High School (CVU) was named one of Vermont's first ENERGY STAR schools, an achievement that places the school in the top 25 percent of the country's energy-efficient schools. The designation is the result of intentional work over the past two years, as students from the CVU Environmental Action Club -- known as EnACT -- piloted the two-year Whole School Energy Challenge (WSEC), a partnership with Vermont Energy Education Program, Efficiency Vermont, and the School Energy Management Program. Thirty students met weekly to influence behavior to help achieve a goal of cutting electricity consumption. CVU reduced electricity consumption by eight percent in the first year, and by another 11 percent in the second year.

What is remarkable about this savings is that it was accomplished primarily by a massive student-led movement, called the 10-Percent Challenge, which urged the



school community to change behavior (along with just a few tweaks to the HVAC system). A schoolwide assembly featuring the Alliance for Climate Change kicked off the Challenge, and was followed up with assemblies for each grade-level at mid-year. A student designed a 10 Percent logo that was used on organic cotton t-shirts and pledge cards signed and posted by faculty. The school also hosted student and faculty focus groups, with EnACT members encouraging groups of faculty or students to generate ideas for electricity savings. The only infrastructure change was the replacement of the auditorium lighting with LED bulbs.

EnACT teamed with Director of Maintenance Kurt Proulx and formed student-led committees addressing areas identified by an energy audit including lighting, information technology, and audio visual. Other committees focused on involving the CVU community in power usage reduction. Notable student-led initiatives included "Hibernation Vacation," which was created to help "power down" and "button up" the school during vacations, an initiative that has spread to other schools in the community. Students also participated in "Unplugging Parties," in which students met right before vacation to ensure that computer labs are unplugged. A math class also supported the challenge by calculating the cubic volume of total refrigeration space in use compared with that available, which led to the shutting down of a refrigerator in the faculty room. Lastly, EnACT asked the school board to consider a lighting retrofit and new HVAC software to manage peak loads. Both requests, made in 2012, were presented to voters in 2013, and implemented in time for the 2013-14 school year.

CVU's massive energy savings were accomplished primarily through a massive student-led movement, called the 10-Percent Challenge, which urged the school community to change behavior.

Student and staff health benefits from innovative partnerships, like the cafeteria's partnership with the Vermont Fresh Network. CVU uses Green Mountain Farm-to-School as a supplier of local, seasonal products. The CVU garden, which students helped plan, plant, and tend, provided 300+ pounds of food to the cafeteria during the 2012-2013 school year. Waste from the cafeteria is sorted into different waste streams: recycle, compost, and landfill. Recent improvements, the result of a group project for a science course and a collaboration between the EnACT club, Chittenden Solid Waste District, City Market, and the CVU cafeteria, have reduced the amount of non-trash being sent to the landfill by 22 percent over last year, as evidenced by annual trash audit reports. The new sorting stations have been featured in presentations by Chittenden Solid Waste District, with the hope that other local schools will model CVU's innovation. The school facility itself is maintained in order to support the health of those in the building, with such practices as changing air filters four times a year, using low-VOC paint, constantly monitoring CO2 and automatically adjusting air intakes, and using green cleaning supplies.



Academically, students can take interdisciplinary courses such as “Money, Energy and Power” through the social studies and science departments. This course offers students an in-depth exploration of the complexities behind energy decision-making by examining both the chemical and political considerations of energy policies. Students study the nitty-gritty of fossil fuels, nuclear power, and alternative energy on a molecular model. They also learn the history of the use of and search for energy sources, and how the ever-increasing demands for energy sources shape geopolitics. By the end of the course, students come to decisions on energy policy and engage in civic activism.

Lake Region Union High School, Orleans, Vt.

Sustainable Agriculture and Energy Savings

What began in 2010 as a hope to reduce Lake Region Union High School (LRUHS)’s electricity consumption by 10 percent in the face of a sharp increase in the school’s overall energy consumption and rising energy costs, has turned into results far exceeding the initial goal. Those efforts were recognized in 2013 when LRUHS was awarded ENERGY STAR status, meaning that the school is a good steward of taxpayer and environmental resources.

The most visible and quantifiable success of the school’s work has been the sustained reduction in the consumption of oil and electricity. LRUHS reduced electrical consumption from an all-time high of nearly 456,000 kWh in 2010 to pre-2004 levels of 301,000 kWh used in 2013, a reduction of 34 percent. Focusing on data has been critical in establishing a comprehensive and continuous facilities improvement plan by the school’s Green Team. Data analysis has changed the school’s culture. Before, they simply paid the bill. Now, the school community is paying attention to numbers, paying attention to practices, and asking questions. The new philosophy has changed how LRUHS thinks.

One might think that the analysis of data is an adult practice. However, students, 59 percent of whom are eligible for free- and reduced-price lunch, have been instrumental not only in gathering and analyzing of data, but also have proposed several of the implemented improvements and continue to develop potential future options. An added bonus to LRUHS’ newfound data vigilance was a discovery last year that LRUHS, and other schools in the local area, had been overcharged by the local utility company dating back to 1999, which resulted in total reimbursements of over \$20,000 to the schools.



LRUHS is situated in a rural region dominated by mountains, rivers, lakes, and trees, and its up-keep and stewardship are critical to the region's activities and economic viability. The school plays an instrumental role in educating the region's youth about the greater importance of understanding of the environment around them and the consequences of neglect and abuse of its resources. Freshman earth science and sophomore biology classes use the school's 100 acres of woods, streams, and ponds; as well as the region's natural resources for focused and applied learning. Juniors and seniors in physics, as part of their curriculum, play an active role in the data analysis and creation of blueprints for recommended energy-use changes. In other projects, students considering careers in engineering worked with a science teacher, who specializes in alternative energy resources, to build solar-powered units for the exterior athletic score boards.

LRUHS' agriculture program in recent years has changed its focus from dairy to sustainable agriculture and stewardship. The program maintains and operates a greenhouse and over an acre of vegetable garden, which produces food used in the school's cafeteria. A new partnership with the Center for an Agricultural Economy allows students to use the facility to process some of the produce in a manner to be used during the winter months. In 2013, LRUHS planted an apple and pear orchard on campus, which soon will bear fruit for the school and provide a great continuous learning opportunity and lab for students. The school also has secured a grant to fund fully a large-scale enclosed composting system on site this spring. This not only will allow the school community to use cafeteria food scraps and serve as yet another learning lab, but will create a byproduct that will be able to be used in the school's food.

Washington

Bertschi School, Seattle, Wash.

A New Building Brings a New Attitude

Bertschi School's commitment to sustainable practices evolves continuously as new issues demand solutions. In 2011, Bertschi realized an audacious goal by completing the Living Building Science Wing. Living Building is a rating system that goes beyond LEED, CHPS, and Green Globes systems, and it is thus very difficult to meet its criteria. Most such buildings have a net zero impact on the environment. The goal for the Bertschi School's building was to meet the demands of the Living Building Challenge set out by the International Living Future Institute, including net zero energy, waste, and water over a minimum of 12 months of continuous occupancy. The building process was an intense partnership between the



administration, the board of directors, students, architects, and developers. The end result is a dynamic building that brought to life some of the students' ideas (such as a "river" created from stormwater run-off), ingenuity from the developers, and a deep commitment from the administration and board. The end result was that, in April 2013, the Living Building Science Wing was certified as the first urban Living Building, the first building to be certified under Living Building 2.0 standards, the first Living Building in Washington state, and the fourth Living Building in the world.

Now, the building is a beacon of learning for students and the broader community. Weekly tours inspire guests to integrate some of the building's features into their own designs, while Bertschi's first- through fifth-graders have at least 90 minutes of class in the Science Wing every week. Fourth- and fifth-graders track water and energy usage in the building, respectively, to ensure that the school maintains net zero usage. All students experience the green wall (a 164 square-foot wall of plants that treats grey water), the composting toilet, and the ethnobotanical garden outside.

Beyond the Science Wing, Bertschi consistently examines and improves current sustainability practices. With a strong sustainable infrastructure in place, much attention this year has focused on community behavior. Bertschi has a Green Team composed of staff members, teachers, students, and parents, which undertakes projects throughout the year to make the school more sustainable and to educate its community.

Sustainability is lived and experienced at Bertschi, not just taught and learned. At the end of the day, kindergarten classes count how many pieces of paper they used that day and compare it to past totals. The fourth grade's focus on salmon and water conservation was woven into their technology project when students produced Salmon Conservation Public Service Announcement videos with iPads.

School-supervised physical education averages 120 minutes per week for middle and high school students, and 90 minutes per week for elementary school students. At least 50 percent of students' annual physical education and physical activity (including recess) takes place outdoors. The school manages a food garden on site, and the school garden supplies food for the cafeteria and other community resources.



Shadow Lake Elementary, Maple Valley, Wash.

These Nature Nuts Are Awesome!

At Shadow Lake Elementary, students compost and use plant material from all of its Discovery gardens. These are places created by students, staff, and volunteers over many years that give the school a unique look and feel. Shadow Lake has been designated a National Wildlife Federation Schoolyard Habitat since 2005, and students have daily opportunities to increase their appreciation of the local wildlife that benefit from the school gardens. Students also participate in after-school and summer nature camps through a district-sponsored program, Nature Nuts. The school has reduced its energy use by 24 percent in the last five years.

The school uses a stormwater curriculum in which students study salmon habitats, including how stormwater is the number one source of pollution in the Puget Sound. Students learn what stormwater management engineers do and replicate the thinking processes they use when they problem-solve. Students investigate the role of the stormwater engineer, learn about runoff, examine maps, put on their engineering hats to look critically at the design of their school yard, generate ideas to improve runoff, and consider stakeholders with possible solutions. After evaluating solutions, the students select one to implement.

Waste-Free Wednesdays are one example of how students work together to reduce lunch waste. Students focus on recycling and composting every day, but work even harder each Wednesday to reduce waste to come as close to zero as possible during lunch periods.

Students learn sustainability concepts by participating in activities that recycle and reuse resources. Waste-Free Wednesdays are one example of how students work together to reduce lunch waste. Students focus on recycling and composting every day, but work even harder each Wednesday to reduce waste to come as close to zero as possible during lunch periods. Each classroom has recycling containers, and students see waste-saving tips and statistics each week in hallway posters, parent newsletters, and morning announcements. Data is collected and shared; there is even an ongoing waste-bin competition between students and staff, which students often win! Student leaders present at teacher meetings and monitor lunchtime waste, recycling, composting, and TerraCycle containers, and give out raffle prizes of reusable lunch containers as incentives. Students also create garden art with non-recyclable bottle caps to keep them out of the landfill. Students who



serve as Green School Ambassadors work before school to ensure that breakfast waste is managed efficiently for composting and recycling. Other students tend to the school's worm farm, which produces vermi-compost to fertilize plants naturally.

Students create and maintain the gardens and trail, and become familiar with the natural environment not only on their campus but also on an adjacent nature trail and on field-trip visits to the nearby Shadow Lake Peat Bog. Fourth- and fifth-grade students in one class partnered with the Cedar River Watershed Project in the creation of an instructional video, in which students became the voices of raindrops experiencing the purifying effects of a rain garden. Fifth-grade students participate in an environmental camp experience at Camp Casey on Whidbey Island each spring. Shadow Lake engages the community with family work parties at least twice a year.

Students share Shadow Lake's efforts and accomplishments on the Tahoma Sustainability Blog, in parent emails, and in weekly schoolwide announcements. Sustainability is woven into their curriculum, providing them with real-world examples and applications of how sustainability works. Environmental awareness is part of the culture at Shadow Lake and will continue to be refined and expanded.

Vancouver Public Schools, Washington

Creating a District of Leading Schools Through Exciting Partnerships

The Vancouver Public Schools Sustainability and Conservation Plan was developed to create a districtwide culture in which staff and students increase their knowledge and awareness of environmental concerns and implement practices that sustain the environment, both within and beyond the school district.

The district began addressing conservation concerns several years ago, starting slowly but accelerating efforts that culminated in June 2009. At that time, the board of directors approved districtwide policies and regulations to manage and support the conservation of natural resources. During the 2009–10 school year, all Vancouver schools established green teams, which identified ways to incorporate environmentally friendly procedures and practices into their daily operations. Each school's program is based on the U.S. Department of Energy's and Washington Green Schools' philosophy for sustainable programs

In 2010, the district reviewed the principles guiding conservation at individual school sites and provided energy and waste management data to all schools. The schools



have now incorporated Utility Manager, an online program that allows each school to track its utility use.

Today, all 37 district schools in varying ways have integrated conservation into their cultures, for example, by maintaining an official green team, by offering career and technical education and career tracts, and by carrying out green practices throughout their school. Several schools now operate at an exceptional level of efficiency, a result achieved by involving students, teachers, principals, building operators, district maintenance, custodial support services, and operations teams. The district's goal is to have 100 percent of sites achieving ENERGY STAR-equivalent status.

The list of partners working with students to integrate best practices varies from site to site and year to year, but some of the partners stand out for their long-time support and financial contributions to advance conservation efforts. They include Energy Trust (E-Trust), Energy Smart, Waste Management, Clark Public Utilities

Vancouver Public Schools realized \$2.76 million in energy cost avoidance over six years.

(CPU), Bonneville Power Administration, Clark County, and Washington Green Schools. These organizations recognize that students will become adults who may own property, own or manage businesses, or simply live, work, and recreate in Clark County.

In 2013, the district continued its “retro-commissioning partnership” with CPU and E-Trust. In retro-commissioning, the partners identify a building that needs retrofitting due to aging equipment and inefficiencies. CPU and E-Trust provide a joint building evaluation, which identifies specific facility improvement measures. After the improvements are completed, CPU and E-Trust provide rebates to Vancouver Public Schools based on future reduced energy use. The rebates help the district offset the cost of the energy-saving projects. Vancouver Public Schools intends to retro-commission all sites across the district through this exciting partnership.

In addition to making fresh fruits and vegetables available at all school lunches, Vancouver Public Schools nutrition services has obtained grants to help students living in low-income parts of the community learn about the benefits of eating fresh fruits and vegetables.

The districts' schools practice a holistic approach to health, with the process and activities varying by site. Indoor and outdoor physical education, health, and outdoor recess are still pillars in the educational day. Several schools are leading the way with walking school busses, running clubs, outdoor learning labs, learning gardens





(rain and food), and greenhouses that use the organic foods grown by students in their culinary arts programs.

Vancouver Public Schools provides opportunities to explore green careers through career software, which shows students, through specifically diagrammed integrated courses, the educational pathways they could take to become qualified for a variety of jobs. Students also are exposed to jobs in conservation through opportunities such as speed networking, guest speakers, company tours, job shadows, internships, and mentorships. In September 2013, students and staff were offered professional development and hands-on civic skills and connections through participation in Vancouver's first annual STEM-fest.

In individual classes, students explored hydroponics as a way to provide sustainable crops to address world hunger. In math classes, students learned basic surveying techniques with support from a professional surveyor, and in social studies classes students have learned the effect of agricultural societies on the history of the world. Environmental information is also incorporated into health classes, where students study the effect of disease on societies, and the need for clean water and sustainable natural resources throughout the world. Students in the Vancouver Public Schools will continue to learn and appreciate the complexity of balancing society's demands on natural resources with the need to sustain a healthy environment.

West Virginia

Cameron Middle-High School, Cameron W.V.

Outdoor Learning for Rural Green Careers

Schools are unique in their social, cultural, geographical, economic, and academic challenges. Cameron Middle-High School (CMHS), a rural seventh- through 12th-grade school within the 312-square-mile Marshall County School District, is making the most of its challenges in order to create a student body – and community – with wise environmental habits that will carry them into the future. CMHS epitomizes best practices in energy efficiency and commitment to LEED; health, wellness, and nutrition of students through Farm to School programming, breakfast and lunch programs, fitness activities, and outdoor education; and sustainability and environmental literacy.

For the past five years, during the construction of the school, the school district has been committed to LEED building principles, as well as to sustainability curriculum





development. CMHS was named West Virginia's 2014 Black Bear Award winner as the state's most sustainable school. In January 2013, CMHS won the Building Conference's Placemaker Award for Innovation and Design.

Under the science, technology, engineering, arts, and mathematics (STEAM) umbrella, CMHS recently started a Project Lead the Way class, which emphasizes awareness of STEAM careers for CMHS students through integrating these content areas into careers. Four staff members have been trained for this program and the art teacher will work on STEAM extensions with this staff. Through these curricula, CMHS instills entrepreneurship in students and, working with Sustainable Learning Systems, the school is able to collaborate with schools within the district and with districts around the nation through Green Schools for Teachers.

CMHS students attend soil conservation camp and forestry camp each year. Future Farmers of America students produce eggs, hams, bacon, and produce to sell to faculty, students, and the community. Agriculture students have a meat processing plant within the school building and a greenhouse for growing seasonal produce for sale. Greenhouse and horticulture classes utilize outdoor space at the school and the football stadium to practice hands-on skill development, such as proper pruning techniques of perennial shrubs and proper weed removal from the site. Students make wreaths and other decorations from these pruned materials. An agriculture education instructor received a \$1,800.00 grant from an energy company to develop trails, and identify native and invasive shrubs on the school grounds. Forestry students used the wooded areas for leaf and tree identification, as well as studied conservation methods in the forestry field. Wildlife management classes make use of vast wooded sites to observe wildlife and their natural habitats as well as to study the migration routes and trails of animals. CHS provides innovative classes that integrate environmental science, physical activity, and career and technical courses. Through studying on-site all that is in and around the school, CHS helps students become college- and career-ready.

CMHS recycles with a vengeance. Recycle bins are in the cafeteria, and the entire school recycles all paper in collaboration with Hilltop Elementary, Marshall County's other LEED-certified school. Other products being recycled or reused include newspaper and catalogs in the art room, clothes in the home economics room (which are turned into salable fashion items), and planting trays in the agriculture education room. Students and faculty have taken on community service projects around recycling and improving the school environment, including schoolwide and communitywide recycling and cleanup projects, and a composting workshop for school staff and students.



Eastwood Elementary School, Morgantown, W.V.

Growing Healthy Kids in a Healthy World

Eastwood Elementary School, home of the Black Bears, is Monongalia County Schools' first LEED certification candidate. Located in Morgantown, W.V., the school commits daily to its mission of "Growing Healthy Kids in a Healthy World" through a focus on curriculum, health, and wellness; the arts; world languages; and community connections. Staff, students, and families use the school as an instructional tool to learn about their effect on the community and the broader world.

Eastwood's unique design is reducing its environmental impact daily. Energy savings is achieved through the use of enhanced wall and roof insulation, and a geothermal heating and cooling system, as well as other energy-saving features. These sustainable qualities allow Eastwood to use about 25 percent less energy than a conventional school of the same size. The school also is designed to maximize the amount of natural daylighting in classrooms through classroom orientation, oversize windows with light shelves and sunscreens, sloped ceilings, light classroom wall colors, and electronic sensors to adjust the output of artificial lighting. Water savings is achieved through the use of waterless urinals, dual-flush toilets, and reduced-flow fixtures, which results in water use of over 31 percent less than in a traditional elementary school.

In addition to the Indoor Air Quality construction-management plan followed during construction of Eastwood, Monongalia County Schools also has implemented a green cleaning program for Eastwood, which will reduce the use of harsh, ecologically unfriendly and unsafe chemicals. The recycling program at Eastwood inspires an understanding of the importance of the creation of new materials from recyclable products. One such program the school supports is the Land Fill Harmonic, which makes musical instruments out of recycled products for at-risk youths.

Operating in the healthy environment that Eastwood offers has inspired staff and students to be mindful of the health and wellness of those in the building as well. The school has committed to promoting a healthy quality of life, with a focus on lifelong wellness and physical activity for students, families, staff, and community members. As a preventive arm to health care, Eastwood is creating exemplary programs that will include a consistent, research-based fitness program through physical education; opportunities for physical activity during school; a before- and after-school fitness program for students; on-site wellness and fitness programs for



staff; and planned wellness programs, classes, and activities for families and the community at large.

Healthy choices taught and modeled. Eastwood's staff has embraced the Responsive Classroom program. This program provides students with energizer breaks throughout the day. Staff and students have learned about food allergies, and the school has a wellness coordinator on staff that educates staff members about exercise and nutrition, and offers activities to promote healthy lifestyle choices. Eastwood also hosts the Smile Program, a visiting dentist that takes care of dental work for students on site.

Eastwood teachers are committed to educating students about their environment. The school has received a grant to participate in the Global Learning and Observations to Benefit the Environment (GLOBE) program. All classroom teachers participated in GLOBE training, and the first through fifth grades participated in GLOBE's cloud protocol and surface temperature field campaigns. In addition to the many features embedded in the construction and operation of the school, the campus contains two unique and distinctive renewable energy teaching tools. The windmill and solar panels at Eastwood are used to help demonstrate how the energy from the sun and wind are converted into electricity. Students also use rain gardens to observe and study various animal habitats.

Wisconsin

Conserve School, Madison, Wis.

Coming From Around the Country to Participate in Robust Outdoor Education

Sustainability is a core value at Conserve School, a private boarding school that brings 60 high school students from around the U.S. to its 1200-acre campus for immersion into environmental studies and outdoor activities through a rigorous college-preparatory curriculum. Conserve School provides students with full scholarships, thereby making attendance at Conserve School attainable for qualified students regardless of socioeconomic status, and provides laptops, and extensive equipment for outdoor activities. Eighty percent of students come from public schools. Conserve School is committed to providing students and staff with healthy and sustainable learning and living spaces that are also effective teaching tools. This commitment has led to a variety of improvements and additions that include recycling and composting programs, energy monitoring systems, and photovoltaic arrays.



The school has transformed high-maintenance ball fields into low-maintenance gardens, replaced standard vehicles with energy-efficient vehicles, expanded water-efficient landscaping and the use of natural- and energy-efficient light sources, installed water bottle filling stations, removed trays from the cafeteria, eliminated vehicular traffic on campus trails along with non-local student trips, built bike shelters, and installed bike repair stations. Student leadership and labor has played a role in most of these program improvements. Facilities staff members aggressively pursue continuous improvement in sustainability. Supervisors conduct frequent audits of energy efficiency and environmental health. For example, campus lampposts were recently switched from metal halide to LED, and photo cells were added so that lights would only turn on when necessary. As a result, the school has reduced its energy use by 50 percent.

Conserve School's design and construction was based on best practices in environmental health. Building features include large space volumes for better air quality, interior glazing to maximize daylight, localized pollutant source exhausts, and low emission finishes of volatile organic compounds. Best practices in environmental health are followed when replacing or repairing materials. For example, replacement carpeting recently was selected after a comprehensive review of alternatives that took into account not only the health and safety of materials but also how installation procedures affected indoor environmental health.

Conserve School promotes wellness by integrating outdoor activities into classes and extracurricular activities. Students swim, kayak, or canoe on campus lakes, and hike, run, or bike on wooded trails. In winter, they ski, snowshoe, ice skate, winter camp, and sled. Many activities integrate academics, stewardship, and outdoor activities. For example, in science class, students pull invasive plants and study water quality while hiking and paddling. Student and staff advocacy for sustainable food has led to many positive changes despite the challenges of a remote location in the far north. School meals include a salad bar, fresh fruits and vegetables, whole grain foods, and vegetarian, vegan, and gluten-free options. In 2013, the school garden produced 233 lbs. of produce for the cafeteria, much of it planted and harvested by students. Connections with local farmers are growing.

Environmental and sustainability education is integrated into all subjects. Required courses include environmental communications, outdoor exploration and leadership, adventure-based physical education, and environmental science. Electives include AP environmental science and art courses that use natural and recycled materials. Wednesday afternoons are dedicated to a unique Stewardship in Action class, during which students learn about environmental colleges and careers, listen to presentations from professionals in environmental fields, and carry out hands-on sustainability and stewardship projects on campus. Projects include removing invasive species, building bat or bird houses, making maple syrup, or working in the



gardens, orchard, or apiary. The school partners with Sylvania Wilderness Area, a national forest, for some of its learning. Fifteen instructors frequently assess student improvement and course satisfaction in the outdoor skills and health and wellness curriculum and make adjustments based on results. Student satisfaction and skill has risen every semester due to this constant improvement in instruction.

In 2009, students in the environmental communication class took part in 350.org's international event to raise awareness about CO₂ levels. Students developed and ran an awareness event for the Conserve community: a walk-a-thon with information stations on how individuals can promote this cause and make changes in their own lives to reduce carbon emissions. During the walk-a-thon, the student body, staff, parents, and other community members walked 394 laps around the academic building, which added up to 100 miles. In science, students learn the forms energy takes, how it is produced and transmitted, the pros and cons of alternative sources, and its role in individual organisms, food webs, ecosystems, and human society. They calculate energy output when doing deep knee bends and when on hiking trips; model energy flows while studying lichen; learn the science behind human contributions to climate change; use scale models to study traditional energy production and compare it to alternative systems; evaluate the potential of alternate energy to offset our reliance on fossil fuels; debate whether the U.S. should expand its use of nuclear power; research energy use at the school and advocate changes; and use a power bike to experience the amount of effort it takes to generate one BTU of energy. Students monitor lake water quality, testing for turbidity, clarity, and other factors; collect macro-invertebrates to gauge the health of lakes; map depth contours of lake bottoms; test for lead contamination in bogs; learn how to conserve water; and study the biochemical interactions and energy flow systems within the wastewater treatment facility.

Hurley K-12 School, Hurley, Wis.

Ice Fishing, Snowshoeing and Learning from the Loons

Hurley K-12 School, located in northern Wisconsin, strives to have a positive impact on its community and environment. By creating a foundation in the educational setting, the school expects that students will make these practices part of their daily lives well into adulthood. The school's strategic plan states that the school will reduce waste, energy consumption, and carbon footprint; and implement a plan to educate students about healthy lifestyles. Hurley works with limited resources in a rural location where more than 40 percent of students qualify as economically disadvantaged.



Hurley K-12 School has worked hard to improve its current facilities despite limited resources. To improve energy efficiency, the school replaced lighting and windows, insulated their roof, and upgraded their HVAC system. The school has worked to manage stormwater run-off by having regionally appropriate landscaping. They also installed a water bottle filling station to encourage students to reduce the use of disposable plastic water bottles. The school has a 46 percent recycling rate, and has reduced its paper use by nearly 50 percent in five years.

The school also has an indoor air quality plan consistent with EPA's Indoor Air Quality Tools for Schools program, a national asthma management plan consistent with the National Asthma Education and Prevention Program's Asthma Friendly Schools guidelines, and meets ASHRAE Standard 62.1-2010 (Ventilation for acceptable indoor air quality). The school regularly tests for radon and is below the acceptable standard. Hurley K-12 School has received multiple grants to increase availability of healthy food and fitness programs. They have participated in Fuel Up to Play 60 for several years. All elementary school students plant a variety of vegetables to be used in the lunch program and sold at the local Iron County Farmers Market. A schoolwide Walk to School Day held in the spring encourages healthy exercise for all members of the community.

The school shines in educating students about reducing environmental impact. In every class from kindergarten to grade twelve, students are engaged in different projects to learn about sustainability and become stewards of their environment. Hurley's science department is fully invested in incorporating energy and environmental education in the curriculum, and the energy cycle is taught in all phases of the curriculum. Fourth-graders, for example, study a unit on energy and magnetism. Activities include lecture and online simulations emphasizing electricity, circuits, and household usage. Professional development is offered to staff in regarding energy and/or energy education: Teachers and staff have opportunities to attend green school educational opportunities. The physics department developed and implemented a classroom energy-monitoring team to recognize positive and negative energy-consumption habits in school buildings. The school uses the Ottawa National Forest for some of its learning and participates in Project Learning Tree.

Students study the local bird population through an annual service-learning project examining the nesting success of area loons. Water chemistry tests are repeated at return visits. In addition, shoreline buffer and aquatic vegetation transects are completed. Loon presence, nesting status, chick production, and chick survival are recorded. In the ninth-grade physical science class, students have built fish cribs on the Turtle Flambeau Flowage to enhance the amount of woody habitat available to fish and other aquatic organisms. Students also enjoy ice fishing using tip up/downs during a unit on simple machines. While participating in the project called Hurley's



Woods and Waters, which now is in its eleventh year of research and education, students have been exposed to outdoor skills such as snowshoeing, canoeing, and orienteering. All participating students have been trained in using scientific equipment, and have learned about monitoring methods such as forestry surveys, soil surveys, water quality monitoring, and wildlife surveying.

Park Elementary School, Cross Plains, Wis.

One School, Six Ecosystems

Park Elementary School has been a model site for energy-use reduction, outdoor learning environments, and annual service-learning projects that benefit the environment and community. The school strives to provide relevant and engaging place-based learning opportunities for students to develop lifelong green habits, and problem-solving skills and strategies.

Park's staff and students continually demonstrate an interest in and commitment to reducing energy. One example of this effort is the school's Stars program, which acknowledges and awards collective achievement for energy conservation at the classroom level. Students see stars hung up outside their classroom doors, which are given out to classrooms that follow the 30-second rule (picking up chairs and trash from the floor so the custodians spend less time at the end of each day cleaning with the lights on), keep their doors shut, use one bank of lights during instruction, have lights off if the classroom is empty, and turn off equipment not in use. The class with the most stars wins hand-crank flashlights. As a result, dark hallways and classrooms before the students arrive and after they leave have become the new normal. The school has been an ENERGY STAR school since 2008, and in the 2012 calendar year had a 49-percent energy cost avoidance. The school works with Johnson Controls and Cenergistic to ensure energy efficiency. Park has become one of the Middleton-Cross Plains Area School District's most energy-efficient buildings.

Park provides and maintains an Outdoor Education Center, including the eight-acre Middleton Cross Plains Area School Forest, a 9,000 square foot rain garden, vegetable garden beds, a restored lower prairie, an upper remnant prairie, and a site recently cleared for an outdoor classroom.



Park School teachers have recycling bins in each classroom, and a milk-carton recycling program has been implemented to properly dispose of hundreds of milk cartons used each day. In addition, students go through their lunches and donate unopened and packaged food to the local food pantry.

A staff member has worked with the Friends of Lake Wingra over the past five years to write grants that provide an annual weekend workshop for local teachers to learn about the Wingra Watershed. The school also engages its community to provide opportunities for role-modeling healthy choices, highlighting local natural resources, and promoting individual and group sustainable practices, using the school site as a community resource. By increasing accessibility to and understanding of the unique ecosystems available for teaching and learning, this work provides the community with a greater sense of ownership of the wonderful outdoor learning spaces available at the school site.

Park Elementary School uses nearly all green cleaning products and has developed a plan using the EPA's Indoor Air Quality Tools for Schools program. Park provides special opportunities for living and maintaining a healthy lifestyle beyond the school day. Students can participate in after-school running programs and a community triathlon, Tri 4 Kids. Park also has created a quarter-mile course for students to challenge themselves to walk, jog, or run without stopping.

Park provides and maintains an Outdoor Education Center, including the eight-acre Middleton Cross Plains Area School Forest, a 9,000 square foot rain garden, vegetable garden beds, a restored lower prairie, an upper remnant prairie, and a site recently cleared for an outdoor classroom. Students have become invested in the vegetable gardens through various projects, including planting native woodland plants with a small group of special-needs students. The members of the larger community of Cross Plains, Wis. maintain the nature trails within the school forest and the restored prairie. Students are privileged to study and compare the ecosystems and habitats present on site: prairie, woodland, remnant prairie, rain garden, lawn, and vegetable gardens.

Outdoor and sustainability learning is driven by student inquiry and problem identification. Environmental education is embedded into math, science, social studies, English, economics, exceptional needs, health education, physical education, and technology classes. The ongoing model for learning at Park is that students study an area of interest, which is engaging to them or to a specific staff member. Then a problem or need is identified, committees are formed, and specific relevant community resources are contacted to research the area of interest. A specific action plan is developed, and staff and students are all taught about the project and provided with the background information necessary to have a strong



understanding about why this specific project is important to the greater Park School community.

Park School's annual service learning projects have included a blood drive, leveled book drive for the Cross Plains Library, 9,000 foot Rain Garden, MOM's Food Pantry Drive, MOM's Food Pantry Garden, Classroom Energy Stars program, Heartland Farm Sanctuary Garden, Coats for Kids, and Caps for the Cure. These annual projects provide students with the role modeling, habits, skills, and strategies they need to be resourceful and successful problem solvers now and into the future.

Tomorrow River Community Charter School, Amherst, Wis.

Following Rural Stewardship Traditions

Sustainability and a clean environment run deep in the values of Tomorrow River Community Charter School (TRCCS). Arousing children's reverence for nature is a major facet of the public school's curriculum. The school is situated at the University of Wisconsin–Stevens Point's Central Wisconsin Environmental Station (CWES), a progressive rural community that has a long history of alternative energy and sustainability. With neighbors and partners like the Midwest Renewable Energy Association, Farmshed, local organic farmers, and lovers of the arts and the outdoors, it is critical to the mission of the school and the community to raise stewards of the earth through education, mentoring, and immersion.

The school recently installed an 8' by 16' greenhouse that uses solar power pumps to circulate the rainwater captured by repurposed barrels from a local brewery. Electricity is conserved by utilizing as much daylight as possible. All classrooms have new, energy-efficient windows on three sides, making daylight abundant indoors. Light sensors are used in bathrooms and common areas, and heating sources in classrooms are turned down at night and on the weekends to reduce electricity use. To reduce paper waste, the governance board utilizes Chromebooks at board meetings. In the classrooms, children use lap-sized slate boards to write on, while teachers use chalkboards as opposed to energy-consuming Smart Boards. Children also do not use textbooks nor do they complete mountains of worksheets. Whenever possible, correspondence between parents and the school is done electronically. CWES also purchases milk in bulk from a local farmer, reducing waste from individual cartons. The CWES kitchen staff uses and washes dishes, as do the children when preparing food for lesson work in the classrooms. Children are also asked to bring handkerchiefs to school instead of facial tissue and hand dryers are installed in the restrooms.



Inspired by the Waldorf tradition, the school's philosophy is to use natural, nontoxic products for everything from building materials to clothing. Cork flooring—a very sustainable product—and wool rugs have been installed in the classrooms. All of the pre-k and kindergarten toys are made from wood, felt, or metal and most are unfinished. All grades use beeswax paints and crayons for art projects and wool yarn for handwork projects. As part of the handwork curriculum, students in the upper grades make fabric pouches for their school supplies, eliminating the need for plastic storage boxes. Music is a large part of the curriculum, and students play recorders and pentatonic flutes made of natural wood. Natural cleaners are utilized in the classrooms by teachers and students to avoid petroleum-based toxins. To ensure fresh air is abundant, screen doors have been installed on all rooms.

Because of the school's unique location and facilities, students get plenty of exercise walking to indoor and outdoor classrooms (the latter made entirely of locally sourced, sustainably harvested hardwoods), and to the on-site chicken coop to collect eggs for the locally sourced food program. Children also hike to the organic garden where they spend an hour a week with a garden intern who interweaves their classroom curriculum with work they do in the garden.

Students spend on average two hours a day exploring — but not disturbing — 200 acres of pine and hardwood forests on glacial Sunset Lake. They are guided to look under rocks and fallen branches for insects and animals, and pay careful attention to their surroundings in order to notice the day-to-day changes occurring in the forest. The students have made structures out of scavenged branches and leaves, and retreat to them during their outdoor play time. Students learn about water cycles, insects, animals, and seasonal changes, the lessons from which are woven into classroom instruction. All subjects are brought to the children in a multitude of ways, so that children with all learning styles will truly understand how math is part of science, and science is part of nature, and nature is part of engineering.

Greendale School District, Wisconsin

Ten Years of Green, Healthy Sustainability

Greendale School District (GSD) has focused on operating green, healthy, and sustainable schools for almost a decade. With five buildings located in suburban Greendale, Wis., GSD has documented significant achievement in sustainability with the leadership of a visionary business manager and the work of a diverse green team.



Ten years ago, GSD energy scores were dismal and, in 2004, a deliberate focus to correct that trend began. After becoming an ENERGY STAR Partner, the district reduced its energy bills by \$200,000 from 2006 to 2011. Efforts included replacing all school heating plants with energy-efficient systems and retrofitting all lighting in district buildings to T-8 energy efficient lighting, with occupancy sensors in most places. The district added digital systems for controlling the environment in the high school, a solar energy hot water system to heat the pool and for domestic hot water, and new fixtures and fountains to save water. The Kilowatt Challenge was initiated in May 2013, encouraging each building to reduce energy use by 5 percent. Posters in each school are updated with energy usage each month to raise awareness and encourage staff to use energy wisely because each building that reaches its goal will receive a portion of the dollars saved.

By becoming an ENERGY STAR Partner and using School Dude Utility Tracking Software, this small district has saved \$200,000 over 5 years.

Checks of recycling efforts are being tracked in a Google document to find ways to reduce waste. Classrooms and offices were de-cluttered using a professional organizer and an initiative to reduce copying costs resulted in a \$20,000 cost savings per year. Turf athletic field was installed to save water, and maintenance and eco-friendly floors eliminate the use of chemicals for cleaning and reduce maintenance.

GSD promotes healthy schools by supporting wellness, good nutrition, and regular physical activity as a part of the total environment where children learn and participate in positive dietary and lifestyle practices. The district sponsors free access to health care services provided by a nurse practitioner at a school-based clinic for students, staff, their dependents, and retirees. The Student and Family Assistance Program gives free confidential access to a variety of professionals for consultation on issues that commonly affect students and their families. It is available to all household members, whether the problem is related to a student, an adult, or the whole family. To promote good nutrition, the district's food service offers healthier choices to students and staff through the school lunch program to meet the requirements of the Healthy Hunger Free Kids Act. The district is launching its "Get Moving and Stay Active 60 Minutes a Day" initiative for families with an introduction to a variety of workouts and physical activities offered to students and families at the annual Parents as Partners conference.

Students from all schools contribute to the school garden at the high school -- planting and tending the garden. Teachers use the outdoor classroom for science instruction at all levels. The youngest learners plant pumpkins and harvest vegetables. Elementary and middle school students plant seeds and their seedlings



in classrooms. Other students raise worms to help nourish the soil and create compost.

The outdoor classroom offers a practical location for high school science experiments and instruction. GHS Science Essentials students work with elementary school students in the garden. High school job training students are involved in planning, planting, and harvesting produce, as well as preparing a variety of foods with it for Free Sample Fridays to introduce students and staff to new, healthy foods as well! During a summer garden challenge in 2013, each school developed a team and was given a garden plot on which to raise vegetables, with an award given to the greatest producing team. The school gardens generated 769 pounds of produce in 2013.

Students record and organize their understandings of energy as they work on non-fiction reading. Students also play the School Savings game from the KEEP Energy and Your School activity guide to learn more ways to conserve energy at school. The district's "Green Team," facilitated by a sustainability specialist, with faculty members, staff, students, and community members, continues to drive concepts into the curriculum and provide resources to teachers for incorporating them in the curriculum.

Late in 2013, Greendale Schools' Canterbury and Middle School woods and Greendale High School woods became registered as school forests in the Wisconsin Community Forest Program. This certification will allow for the expansion of the district's outdoor classroom space and increase opportunities within the existing curriculum at all grade levels and across disciplines. This designation means Greendale Schools will be eligible to receive free forest management assistance along with free seedlings from the state nursery program. The district also will be able to apply for grants from the Wisconsin Environmental Education Board and to receive assistance from the statewide school forest education specialist. As the forest management plan is implemented, the additional outdoor learning spaces will expand opportunities for students to see first-hand how species interact and how living and nonliving things work together to support a healthy ecosystem.





Acknowledgements

This year, ED-GRS was all about sustainability. Real institutional sustainability, that is. We learned from our green schools on our 2013 best practices tour, which had, from coast to coast, a number of striking similarities – the ubiquitous “green team” among them. Here at ED, we now have a robust ED Green Team as well, recruited from across the Department to forge a full staff, even in tight times. You may have heard that ED-GRS was launched only three years ago, without funding, new statutory authorities or, indeed, more than a single employee. As the movement has grown across the nation, so too has our team here at ED to bolster your work – most notably, without a single new hire.

I am as proud of our ED Green Team as of our latest cohort of honorees: Strategic Communications Manager Jeanne Ackerson, Web Content Manager Malissa Coleman, Social Media Manager Kyle Flood, Creative Design Manager Cory Leitao, Newsletter Editor Brendan Loughran, and Publications Manager Jennifer Padgett have managed to find time, in addition to their regular duties, whether they work in the Office of Communications and Outreach, the Office of the Secretary or the Office of the General Counsel, to help recognize the innovative work that you do. Let me tell you, like our honorees, they are a truly impressive bunch!

Thanks go to several other ED colleagues who pitched in this year: Meredith Bajgier, Joe Barison, Diana Huffman, Linda Pauley, Elaine Venard, and Nicole White. We also thank 50-plus federal reviewers at other agencies for their time and expertise, particularly at the EPA, DOE, NOAA, and USFS. Once again, it is truly a team effort.

Of course, this entire award would not be possible without the participation of some 30 state education agencies and their partners, which constitute their own green teams to implement statewide competitions that select schools and districts to nominate to ED. They are a most dedicated group of facilities, health, and environmental education professionals, who support the work of the schools and districts in your state.

Finally, thanks to Adam Honeysett, Managing Director of State and Local Outreach for his unfailing support to school facilities, health, and environment at ED.

