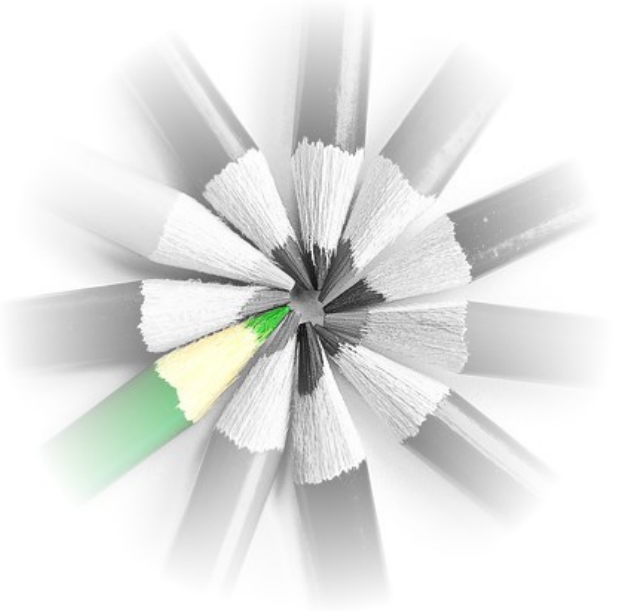
Is Becoming a Green School Right for Your School?



Foreword:

As principals, we are increasingly called upon to deal with educational challenges while at the same time doing more with less. The emerging green school movement offers some welcome help. While it can't solve all of our problems, it offers an important piece of the solution.

Green schools can help address many of the challenges facing school principals today. For example, green schools are able to provide improved learning environments for engaging the interest and attention of students, thus potentially reducing costly discipline and absenteeism management. Green schools also can keep teachers more engaged, thus cutting costs of absenteeism and job turnover, which in turn make schools better places to work and helps educators focus on educating. Most green schools are able to cut their utility expenditures by 25% to 50%, saving an average of $100,000/year per school.

What exactly is a "green school?" No widely accepted definition exists. For some, it means green school buildings, for others it means a healthy school environment, and for others it means an environmentally literate student body. The U.S. Department of Education recently brought some clarity to this confusion by defining a green school as "all of the above”-- a school that produces environmentally literate graduates, minimizes its environmental footprint, and has a positive impact on student and staff health. This sort of comprehensive, systemic approach makes good sense, for

each of these three "pillars" -- environmental literacy, environmental impact and student health -- reinforces the others.

The green school movement is growing rapidly. The number of K-8 schools defining themselves as “green” has risen from a few hundred to several thousand over the past decade or so. In the past three years alone, nearly 2,000 K-8 schools have certified themselves as green. More than a dozen state-based NGOs are now developing and certifying green school systems, and a dozen or more national non-profit organizations are supporting the efforts of schools to become greener. Thirty-nine states, led almost equally by Republican and Democratic Governors, have signed on to participate in the second year of the new U.S. Department of Education Green Ribbon Schools program, and over 500 schools to date have applied for the Department's Green Ribbon Award, offered annually to the best performing green schools in the nation.

The following report lays out some easy actions and attitudes that you can take to get started as you engage in the discussion and creation of green schools.

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Executive Director

1. Improved Student Academic Performance

A green school positively impacts student learning and performance in two ways. First, a green school improves overall student learning and performance through its curriculum--in part by engaging students in the natural world and age-appropriate topics that will be part of their future. Studies indicate that environmental education especially increases student engagement and performance in science. Such an increase is likely due to the fact that environmental education connects classroom learning to the real world: when given a choice, students often gravitate toward environmental topics and material. For many of the same reasons, studies have shown that environmental education can also improve student achievement in other core subject areas such as reading (sometimes dramatically), math, and social studies. In this same study, schools using the environment as an integrating context or theme across the curriculum also saw:

- reduced student discipline and classroom management problems;
- increased student engagement and enthusiasm for learning; and,
- greater student pride and ownership in accomplishments.

Environmental education also helps to address “nature deficit disorder.” A Kaiser Foundation study found that, unlike prior generations, children today spend an average of seven hours each day in front of the computer and TV but less than four minutes a day in unstructured outdoor play. This lack of outdoor play and discovery has been correlated with such effects as obesity, loneliness, depression, attention problems, and greater social isolation. Field trips, schoolyard habitats, and outdoor exercise can all help combat this widespread and growing deficiency.

Second, the quality of the school building and environment itself has a direct impact on a student's ability to concentrate and learn. Students perform better academically in a school with better indoor air quality and ventilation, good acoustics, and daylighting. For example, a recent survey of green schools found that 74% of the respondents reported that green buildings help improve student productivity and test scores. About half of those who make green building improvements also link improved acoustics and daylighting with increased attentiveness and student engagement. And 83% report that teacher satisfaction increases as a result of being in a green school, which can also have an impact on productivity.

Where to start: If you can identify or reclaim a small plot of land on school property or nearby, something as simple as creating **a schoolyard garden** is a wonderful way to teach students a myriad of topics such as ecology, food, nutrition, and many more. The project can produce food for the cafeteria, get students outside and actively engaged, and reduce your school's environmental impact (see www.edibleschoolyard.org for ideas and resources). You could also create **a schoolyard habitat** where educators and students alike learn how to attract and support local wildlife (www.nwf.org/How-to-Help/Garden-for-Wildlife/Schoolyard-Habitats.aspx), **or a rain garden** (www.sustainability.fcps.net/media/641050/raingardenmanualforschools.pdf)

The Green Education Foundation (www.greeneducationfoundation.org), Project Learning Tree (http://www.plt.org/environmental-curriculum-elementary-middle), Project WET (projectwet.org), and Project WILD (www.projectwild.org) all offer teacher workshops and free hands-on learning modules which are easy to incorporate into your classes.

2. Student and Staff Health

The primary factors that cause children to stay home from school due to illness are high concentrations of indoor and outdoor air pollutants. Half of our nation's 115,000 schools have problems linked to indoor air quality. As a result, the American Lung Association has found that American school children miss more than 14 million school days a year because of asthma (the leading cause of school absenteeism from a chronic illness) which is worsened by poor indoor air quality. Critical indoor pollutants are nitrogen dioxide, mold, and other microbial organisms, which can cause respiratory infections and trigger asthma attacks. This is why a green school's adequate air ventilation, use of materials with little or no toxic substances, and sound maintenance practices make such a difference in student and staff health.

Studies evaluating the impact of improved indoor air quality found an average reduction of 38% in asthma in buildings with improved air quality. In a 2006 report, the National Academy of Sciences found an association between excess moisture, dampness, and mold in buildings and adverse health outcomes, most notably asthma and respiratory symptoms, among both children and adults. The same report found that the background

noise level in a typical school was 10 times louder than the acceptable range. Studies of nine and 10-year-olds show that chronic exposure to noise impairs their cognitive performance and reading comprehension.

And it is not all about air quality. Of the 48 pesticides most commonly used in schools, the U.S.EPA classifies 22 as possible or probable carcinogens. Green schools address this by using "integrated pest management" (a method used to control pests in an environmentally responsible manner) and janitorial practices that minimize use of harmful chemicals. Though use of polychlorinated biphenyls (PCBs) is banned, they still exist in many school buildings (primarily in fluorescent light ballasts and caulking) built between the 1930's and late 1970's. PCB exposure is associated with permanently depressed IQ, increased risk of attention deficits, hormonal and immune disruptions, among other serious health problems.

Where to start: Convince your district to start buying **green cleaning supplies** and insure your custodial staff know how to use them (see www.greencleanschools.org/s2m-use-green-products.html). Conduct a **toxic chemical inventory** of your school and phase out use of all toxics (see www.epa.gov/schools/chemicals.html). Begin an **indoor air quality management program** (see http://www.epa.gov/iaq/schools). Work with your staff to begin an **Integrated Pest Management program** (www.epa.gov/pesticides/ipm) that employs commonsense strategies to reduce sources of food, water and shelter for pests in your school buildings and grounds.

3. Green School Buildings and Operations

Green schools are more than a passing fad. A McGraw Hill Construction SmartMarket survey estimated that 45% of all school construction projects in 2012 were green, and 83% of those surveyed reported that they did at least some green retrofits or improvements in the last three years.

Conventional wisdom says that green school buildings cost more to build. In some cases, the average upfront costs of a new green school building does cost slightly more. But knowledgeable architects increasingly are able to keep these upfront costs in line with conventional buildings; for example, by reduced code compliance costs and less expensive HVAC systems as a result of energy saving features in the building.

More importantly, all evidence indicates that the subsequent savings to the school from energy and water savings, improved teacher retention, and lowered health costs alone total about **four times the additional cost of going green** over its lifetime. Given that operating expenses over the 30-50 year life of a building average three times as much as the initial construction cost, any potential small increase in construction costs for a green school can be paid back multiple times over the life of the building.

But these savings won't be fully realized if school staff and students aren't properly trained. All the insulation in the world won't help if thermostats are overridden as a result of not being set properly. Daylighting only reduces energy if the lights are turned off. Investments in green school renovation projects can produce even greater returns than new buildings, with annual utility savings alone in the 20-30% range.

This significant return on investment does not include the significant financial savings to the school's host community from reduced cost of public infrastructure (energy, water and sewage) and lower costs from reduced air and water pollution as well as savings which are more difficult to quantify such as reduced teacher sick days, reduced insured and uninsured risks, improved power quality and reliability, increased state competitiveness, and educational enrichment. All told, these savings can exceed the initial costs by a factor of 20.

Teacher Satisfaction and Retention: Green classrooms where visual and thermal comfort are high, acoustics are good, and the indoor air is fresh and clean act as positive factors in recruiting and retaining teachers and in improving their overall satisfaction with their positions. On the other hand, 40% of teachers who gave

their facilities a grade of C or below in a recent study said that poor building conditions have led them to consider leaving their school.

Increased Average Daily Attendance (ADA): Since the majority of a school's operating budget is often directly dependent on ADA, even a small increase in student attendance can significantly boost the operating budget. One study estimates that green schools achieve an increased attendance rates range from one to two percent, which translates into an additional $94,000-$188,000 annually from the state.

Energy and Water: A survey of 30 green schools found an average annual savings of $100,000 from energy and water conservation – enough to hire two new teachers.

Reduced Environmental Impacts: A 2006 study of 30 green schools estimated that a green school can dramatically reduce its environmental impact by:

- 1,200 lbs of nitrogen oxides (NOx) – a principal component of smog.
- 1,300 lbs of sulfur dioxide (SO2) – a principal cause of acid rain.
- 585,000 lbs of carbon dioxide (CO2) – the principal greenhouse gas.

- 150 lbs of coarse particulate matter (PM10) – a principal cause of respiratory illness.
- 74% reduction in waste – 4% of the entire municipal waste stream comes from schools, primarily food and paper.

Where to start: Short of a full renovation or brand new buildings which is beyond the authority of most principals, there are still many things you can do to save money and reduce your environmental impact. Start a **recycling** program (ecocycle.org/schools/greenstarschools) and enlist your school in trying to get to zero waste. Engage your students and staff in an **energy audit** (www.countdownyourcarbon.org/SchoolEnergyAudit.pdf). Then set a school goal for reducing your carbon footprint and energy use (www.nwf.org/Global-Warming/School-Solutions/Eco-Schools-USA/Become-an-Eco-School/Cool-School-Challenge.aspx). Call your local utility or engage an ENERGY STAR Portfolio Manager specialist to help reduce energy use (www.energystar.gov/index.cfm?c=k12_schools.bus_schoolsk12)

4. What Are Some Additional First Steps Toward Greening My School?

- Check NAESP's website for ideas: www.naesp.org/green-schools
- Creating a green school in these times of budget cuts and shortfalls requires creativity. One of the best guides for thinking about how to finance this work is a recently released guide from the Department of Energy called Financing Energy Upgrades (available for download at http://emp.lbl.gov/sites/all/files/lbnl-6133e.pdf). This thorough guide covers grants, bonds, leasing arrangements, and other financing options.
- A call to your state legislator can help uncover any funding options offered by your state government.
- Check with your state Green Ribbon Schools coordinator (www2.ed.gov/programs/green-ribbon-schools/state-contacts.doc) for local resources.
- Read the stories of the latest Green Ribbon School winners for inspiration and ideas (www2.ed.gov/programs/green-ribbon-schools/highlights-2013.doc)

Many NGOs offer various forms of greening help to schools. Here are just a few:

Learning:

- Check with your state environmental education association: www.naaee.net/us/affiliates/map
- Eco-Schools USA - National Wildlife Federation: www.nwf.org/eco-schools-usa.aspx

Building:

- U.S. Green Building Council's Center for Green Schools: www.centerforgreenschools.org
- Collaborative for High Performance Schools: www.chps.net
- National Clearinghouse for Educational Facilities: www.ncef.org

Health:

- Healthy Schools Network: www.healthyschools.org
- Healthy Schools Campaign: www.healthyschoolscampaign.org

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National Association of Elementary School Principals
Serving all elementary and middle-level principals