

## Do Our Kids Have Nature-Deficit Disorder?

*Richard Louv*

**Some are hyperactive. Some are distracted. Some are obese. Schools can improve both health and learning by reintroducing students to the natural world.**

A few years ago, I was deeply moved by a photograph I saw on the back page of a magazine. It showed a small boy at the ocean's edge, his tracks receding in the wet sand toward the water. Beyond the sand, one could see a gray sky, a distant island, and a long, even wave in the beginning of collapse. The boy had turned to face the photographer. His eyes were wide and his mouth was open in an exclamation of discovery. He was a picture of joy.

This powerful black-and-white image was accompanied by a short article explaining that this child had a problem—he was hyperactive and could not pay attention. Because he disrupted the other students, he had been expelled from school. At first, his parents did not know what to do. But they were observant. They had already seen how nature calmed their son and helped him focus. Over the next decade, they seized every opportunity to introduce him to the natural world—to beaches, forests, and dunes as well as to the rivers and mountains of the American West. The little boy turned out fine. The photograph was taken in 1907. The boy's name was Ansel Adams.

But what if Ansel's parents had not given him the gift of nature, I wondered? Would he have given us the gift of his photography—the dome of Yosemite and the moon rising over Hernandez, New Mexico—all those iconic images that have helped shape the modern conservation ethic?

Many teachers across the United States—I call them *natural teachers*—intuitively or experientially understand the role nature can play in children's education and health. I meet them often. They're in every school: science teachers, English teachers, and many others who are not formally environmental educators, who insist on taking their students outside to learn—to write poetry in a natural setting, to learn about science or history outdoors. These teachers see a schoolyard garden, a park, a nearby woods, or a beach as a learning environment—a place to find wholeness and health. They tell stories, about the 10-year-old classroom troublemaker who becomes a leader outdoors, whose demeanor changes almost magically from agitated and disruptive to focused and respectful; about a budding writer who blooms; or about the young scientist who discovers in a field what was hidden in a textbook.

### The Evidence Grows

Bringing children to the natural world—or bringing nature to them—is not a panacea, nor is it the only way for parents and teachers to ignite curiosity and wonder or to help children focus. However, researchers are assembling a growing body of evidence that strongly suggests the importance of nature to children's health and their ability to learn.

Environmental educators and groups such as Project WILD, Project Learning Tree, and proponents of natural schoolyard habitats have worked for decades to introduce children to nature. Some educators have emphasized this approach in the context of classroom learning; others have focused on getting students outside. Efforts to engage students in and through the natural environment go by many names, including community-oriented schooling, bioregional education, nature studies, experiential education, and place-based or environment-based education. But the basic goal is this: to use the surrounding community, including nature, as the preferred classroom.

Researcher and educator David Sobel (2008) says that we should consider place-based education as "one of the knights in shining armor." Students in such programs typically outperform their peers in traditional classrooms. Sponsored by many state departments of education, a 1998 study documented the enhanced school achievement of youth who experience curriculums in

which the environment is the principal organizer (Lieberman & Hoody, 1998). More recently, studies in California and across the United States showed that schools that used outdoor classrooms and other forms of nature-based experiential education saw significant student gains in social studies, science, language arts, and math. Another study found that students in outdoor science programs improved their science test scores by 27 percent (American Institutes for Research, 2005).

Unfortunately, the relationship among nature experience, learning, and health is a new frontier. Many of the available studies describe correlations rather than cause and effect. We need to do additional longitudinal research, but as Howard Frumkin, who heads the National Center for Environmental Health at the Centers for Disease Control and Prevention, says, "We know enough to act."

Some of the most intriguing studies are being conducted by the Human-Environment Research Laboratory at the University of Illinois, where researchers have discovered that children as young as 5 showed a significant reduction in the symptoms of attention deficit/hyperactivity disorder when they engaged with nature (Kuo & Taylor, 2004). Recent studies have also suggested a connection between the decline in outdoor activities and the dramatic rise in both childhood vitamin D deficiency (Huh & Gordon, 2008) and myopia (Rose et al., 2008).

One interesting study looked at the effect of neighborhood greenness on inner-city children's weight over time (*Science Daily*, 2008). Researchers reported an association between higher neighborhood greenness and slower increases in children's body mass over a two-year period, regardless of residential density. This underscores the need for urban design to provide a greener, healthier environment, even in the most densely populated neighborhoods. Surely such a design can also improve children's readiness to learn—and their sense of wonder.

### **Nature—Left Out in the Cold**

Unfortunately, too many school districts have contributed to a growing gap between nature and children. I call this *nature-deficit disorder*, which is not a medical diagnosis, but a description of the growing gap between human beings and nature, with implications for health and well-being.

In the 1970s, the physical and academic designs of too many school districts turned inward, resulting in the building of windowless schools, the banishment of animals from classrooms, and even the elimination of recess and field trips. Several forces have been at work. Within schools, these forces include the wave of well-intentioned and underfunded education reforms. Beyond the schools, they include poor urban design, disappearing open space, parental fear of "stranger danger," amplified news cycles and sensationalized entertainment media, competition from computers and video games, the overstructuring of childhood, and the devaluing of natural play.

### **What Educators Can Do**

Many students today are aware of global threats to the environment but hardly notice what's happening on a more personal scale—that their physical contact with nature on a day-to-day basis is fading. So what can educators do to reverse this trend?

#### **Become a Natural Teacher**

As a first step, principals, school board members, administrators, and teachers should better inform themselves about the cognitive and other health benefits of experience with nature. The Children & Nature Network Web site ([www.childrenandnature.org](http://www.childrenandnature.org)) has links to original research for more than 100 studies on a variety of topics—from the benefits of unstructured free play, environment-based curriculums, hands-on outdoor learning, and recess; to the need for more natural schoolyard environments; to the psychological benefits of natural settings; to nature's potential to reduce both stress and obesity.

#### **Network with Other Natural Teachers**

There are many challenges related to taking students outdoors, such as curriculum and standards integration, discipline issues, materials management, and safety. However, by networking, teachers both within and outside the United States can share ideas for getting students outdoors, support one another, and know they are not alone in their efforts. The Children & Nature Network invites educators to join its Natural Teachers Network at [www.childrenandnature.org](http://www.childrenandnature.org).

### **Teach Other Teachers**

Many educators, especially new teachers, feel inadequately trained to give their students an outdoor experience. We need additional support for existing teacher-training programs, of course, but in these challenging economic times, teachers can tap other resources. For example, many wildlife refuges provide professional development programs that have been correlated to public school curriculum standards (see [www.fws.gov/refuges](http://www.fws.gov/refuges)). Robert Batemen, the Canadian wildlife artist whose Get-to-Know campaign strives to connect children to nature, suggests an informal teacher-to-teacher approach: Teacher Nature Clubs, through which teachers who are experienced in nature organize half-day hikes each month with other teachers, lending insight and enthusiasm to those with less experience in the natural world.

### **Green the Schoolyards**

Tap the knowledge of such programs as Eco-Schools in Europe ([www.eco-schools.org](http://www.eco-schools.org)); Evergreen in Canada ([www.evergreen.ca/en](http://www.evergreen.ca/en)); and the Natural Learning Initiative ([www.naturalearning.org](http://www.naturalearning.org)) in the United States. Educators can find a list of schoolyard greening organizations worldwide, including ones in Canada, Norway, Sweden, the United Kingdom, and the United States, at [www.ecoschools.com](http://www.ecoschools.com). To get started, send for the U.S. Fish and Wildlife Service's *Schoolyard Habitat Project Guide* (available at [www.fws.gov/chesapeakebay/schoolyd.htm](http://www.fws.gov/chesapeakebay/schoolyd.htm)), which can help teachers and students create wildlife habitats on school grounds.

### **Create Nature Preschools**

Ensure that children begin their school years knowing the physical world firsthand. Encourage nature-based public, charter, or independent K–12 schools that place community and nature experience—not only environmental education—at the center of the curriculum. Resources include Antioch's Center for Place-Based Education ([www.antiochne.edu/anei](http://www.antiochne.edu/anei)), which promotes community-based education programs and partnerships among students, teachers, and community members that support student achievement, community vitality, and a healthy environment.

### **Establish an Eco Club**

Crenshaw High School Eco Club is among the most popular clubs in this predominately black high school in Los Angeles. Students are introduced to the natural environment through the club's weekend day hikes and camping trips in nearby mountains, as well as through expeditions to Yosemite and Yellowstone national parks. Community service projects include coastal cleanups, nonnative invasive plant removal, and hiking trail maintenance. Past members become mentors for current students. The grades of participating students have improved.

### **Bring Nature to the Classroom**

Start a Salmon in the Classroom project or a similar endeavor. In Washington State, participating students in more than 600 schools receive 500 hatchery eggs to care for in each classroom (see <http://wdfw.wa.gov/outreach/education/salclass.htm>). Students learn about life histories and habitat requirements and release the salmon into the streams they have studied.

### **Create Nature-Based Community Classrooms**

Beyond the classroom and school grounds, schools, businesses, and outdoor organizations can work together to introduce students to nature centers and parks and sponsor or promote overnight camping trips. School districts can follow Norway's lead and establish farms and ranches as "the new schoolyards," thereby creating a new source of income to encourage a farming culture. As an added incentive, an outdoor classroom is much less expensive to build than a new brick-and-mortar one.

### **What Parents and the Community Can Do**

Last year, in Austin, Texas, I was speaking with a middle school principal who was sympathetic to the cause but felt overwhelmed by all the demands that he and his colleagues already faced. "You want me to add this to my plate when it's already overflowing?" he asked. "I can't do this without outside help."

He was right. Naturalizing education will be an enormous task, and educators can't do it alone. Families and the whole community can help by doing some of the following.

### **Support Legislation**

We can support legislation at the state and national levels that advances environmental education in the classroom and outdoor experiential learning. The No Child Left Inside Act of 2009, introduced in the U.S. House of Representatives and Senate, would create an environmental education grant program for teacher development and provide funding to help ensure that primary and secondary school students are environmentally literate. The legislation's focus is not only on classroom education, but also on actually getting students outside and into nature.

### **Join the Movement**

Even more important is the emerging Leave No Child Inside movement. The Children & Nature Network, a nonprofit organization that advances the movement, reports that some 60 regional campaigns have sprung up in the United States and Canada over the past four years, as have a number around the globe, which together make up a growing international network of thousands of individuals, families, and organizations. Regional campaigns include local, state, and national park and recreation agencies, educators, health-care professionals, conservationists, children, college students, government officials, and businesspeople. The movement appears to transcend political and religious divisions. That bodes well for schools; in a sense, the movement could be creating a new constituency for education.

### **Get Parent-Teacher Groups Involved**

As a practical matter, parent-teacher groups can support schools and educators financially and by presenting annual Natural Teacher Awards to educators who have used the natural world as an effective learning environment for their students. Parent-teacher groups, schools, and educators can also encourage parents to create family nature nights. For example, in Omaha, Nebraska, a consortium formed to foster nature-based play is hosting five family nature nights at local elementary and middle schools, which will offer hands-on, nature-based play activities for children and their families.

### **Start an Outdoor Club**

A 2nd grade teacher and his wife in Roanoke, Virginia, decided to spend more time with their three children on weekends doing family hikes and other outdoor adventures. One day, their 5-year-old son asked, "Why are we the only family having this much fun?" So the family mapped out a monthly outdoor adventure schedule for the coming year and invited neighbors to join. Today, they have 352 families on their e-mail list. Member families meet on Saturdays or Sundays at various parks and other venues where they experience the natural world. A similar parent-organized group in California, the Inland Empire Kids Outdoors club, has signed up 227 families.

Families in any kind of neighborhood can start such clubs—and they can do it now. (Go to [www.childrenandnature.org](http://www.childrenandnature.org) for a tool kit for jump-starting family nature clubs.) What if family nature clubs and networks really caught on? What if they grew in number, just as book clubs have in recent decades? Not only would they help reduce the stress that parents and children experience in their hurried lives, but also they would promote stronger family bonds. And stronger families mean stronger schools.

As the Austin middle school principal and I talked about these approaches, he became increasingly excited, especially about family nature clubs. "I could encourage parents to create these groups," he said, "and even help them weave in some curriculum-based learning."

### **The Gift We Need to Give**

Evidence suggests that the broad movement to connect children to nature could send calmer, more curious, better-balanced children into the classroom. Getting outside is also a great stress reducer for teachers. Canadian researchers found that teachers expressed renewed enthusiasm for teaching when they had time outdoors (Dyment, 2005). In an era of increased teacher burnout, we should not underestimate the effect of green schools and outdoor education on teachers.

Thinking about that photo of the little boy on the beach, I wonder: How many other little Anselms and Anselettes are out there now? And what gifts could they offer future generations—if we give them the gift of nature?

### Resources to Help Connect Students to the Natural World

The following resources can help educators reconnect students to the natural world:

#### On the Web

- *Nature-Deficit Disorder Survey*. Do you have this "disorder"? To find out, take this online survey at [www.eeweek.org/resources/survey.htm](http://www.eeweek.org/resources/survey.htm). The survey was created by an 8th grade teacher for National Environmental Education Week.
- *The Children & Nature Network* ([www.childrenandnature.org](http://www.childrenandnature.org)). In addition to presenting current research and news, the Children & Nature Network offers information about ways to bring the benefits of nature to schools, families, and communities. The author, with educator Cheryl Charles and others, founded the network to build the movement to connect children to the natural world.
- *Natural Teachers Network* ([www.childrenandnature.org](http://www.childrenandnature.org)). This new network honors, supports, and provides tools to educators who take their students outside to learn.
- *National Wildlife Federation* ([www.nwf.org](http://www.nwf.org)). Be sure to read the federation's new study, *Time Out: Using the Outdoors to Enhance Classroom Performance*.
- *Nature Rocks* ([www.naturerocks.org](http://www.naturerocks.org)). Parents and teachers can locate nature opportunities in their own zip codes and download a free guide to creating family nature "staycations."

#### Professional Resource Programs

- *Project Learning Tree* ([www.plt.org](http://www.plt.org)). Created by the American Forest Foundation, this multidisciplinary environmental education program for preK–12 students includes topics ranging from forests, wildlife, and water to community planning, waste management, and energy.
- *Project WILD* ([www.projectwild.org](http://www.projectwild.org)). Project WILD offers an interdisciplinary instructional program for K–12 educators that ties nature-oriented concepts to all major school subjects, requirements, and skill areas.
- *Classroom Earth* (<http://classroomearth.org>). Created by the National Environmental Education and Training Foundation, Classroom Earth maintains a directory of K–12 environmental education programs and resources for teachers, parents, and students.
- *National Wildlife Refuge System* ([www.fws.gov/refuges](http://www.fws.gov/refuges)). Managed by the U.S. Fish and Wildlife Service, the system indicates wildlife refuges by zip code and offers teacher training and other education opportunities.

#### Publications

1. *Green Teacher* magazine, available in English, Spanish, and French ([www.greenteacher.com](http://www.greenteacher.com)). The magazine, which comes out four times each year, contains practical articles and activities for students ages 6–18.
2. *The Learning with Nature Idea Book: Creating Nurturing Outdoor Spaces for Children*. By Nancy Rosenow, James R. Wike, and Valerie Cuppens (Arbor Day Foundation, 2007). This book includes 10 guiding principles for establishing an outdoor classroom.

## References

American Institutes for Research. (2005). *Effects of outdoor education programs for children in California*. Palo Alto, CA: Author. Available: [www.air.org/news/documents/outdoorschoolreport.pdf](http://www.air.org/news/documents/outdoorschoolreport.pdf)

Dyment, J. (2005). *Gaining ground: The power and potential of school ground greening in the Toronto District School Board*. Toronto, Ontario: Evergreen.

Huh, S. Y., & Gordon, C. M. (2008). Vitamin D deficiency in children and adolescents: Epidemiology, impact, and treatment. *Reviews in Endocrine and Metabolic Disorders, 9*(2), 161–170.

Kuo, F. E., & Taylor, A. F. (2004). A potential natural treatment for attention-deficit/hyperactivity disorder: Evidence from a national study. *American Journal of Public Health, 94*(9), 1580–1586.

Lieberman, G. A., & Hoody, L. L. (1998). *Closing the achievement gap: Using the environment as an integrating context for learning*. Poway, CA: Science Wizards.

Rose, K. A., Morgan, I. G., Ip, J., Kifley, A., Huynh, S., Smith, W., et al. (2008). Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology, 115*(8), 1279–1285.

*Science Daily*. (2008, October 29). Neighborhood greenness has long-term positive impact on kids' health. Available: [www.sciencedaily.com/releases/2008/10/081028074327.htm](http://www.sciencedaily.com/releases/2008/10/081028074327.htm)

Sobel, D. (2008). *Children and nature: Design principles for educators*. Portland, ME: Stenhouse.

---

**Richard Louv** is the author of *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* (Algonquin Books, 2008) and Chairman of the Children & Nature Network ([www.childrenandnature.org](http://www.childrenandnature.org)). He was awarded the Audubon Medal in 2008.

---

Copyright © 2009 by Richard Louv

## NOTE TAKER