Environmental Education Saves the Day

Becoming a Project Learning Tree (PLT)–certified school unified faculty, boosted student achievement, and saved one school from closure.

By Sarah Haines and Cynthia Kilpatrick

PHOTOGRAPH COURTESY OF THE AUTHORS

Students study plants in an on-site greenhouse donated by the community's Rotary Club.

At the start of each school year at Oil City Elementary Magnet School in Oil City, Louisiana, eager students ask, "What's our theme this year?" This curiosity comes from their expectations that they will study a different environmental concept each year. Kindergarten classes learn to "Be a Friend to the Earth," followed by life cycles in the first grade, and continuing through forestry, aquaculture, horticulture, meteorology, and finally habitats in sixth grade. This environmental science focus has not only increased enrollment and produced dramatic increases in test scores but also brought national recognition to the school and staff.

Everything Environmental

Science education advocates often complain that science is excluded in elementary schools because of the emphasis on mathematics and literacy. While this may be true in some cases, a focus on environmental education offered our rural school a way around that problem by providing numerous opportunities for integration across the curriculum.

Five years ago, our school faced the possibility of closure due to dwindling enrollment. In an attempt to save the community school, the school administration requested magnet designation from the Caddo Parish School Board. Beginning with the 2001–2002 academic year, the school became a magnet school with an environmental theme as its educational focus. The only stipulated requirement for entrance was residence in Caddo Parish. The new program integrated environmental science concepts across the curriculum and increased classroom instructional time to 200 school days divided into four, 10-week grading periods.

We chose an environmental focus because of the school's proximity to Caddo Lake (the largest natural freshwater lake in the South) and the importance of the oil and gas industry, agriculture, and forestry to the area economy. The group felt that investigating issues of local importance would make learning more authentic and that the magnet designation would allow students in the surrounding area to attend without admission requirements based on grades.

To prepare for the new focus, the entire school faculty received training in three nationally recognized environmental education programs: Project Learning Tree (PLT), Project Wet, and Project Wild (See Internet Resources). The faculty and administration

Figure 1.

A list of environmental education books.

The PLT curriculum includes many other suggestions for recommended reading. However, these are some of my favorite books I use in the classroom. I couldn't teach about the environment without them!

Barrett, J., and R. Barrett. 1978. *Cloudy with a chance of meatballs*. New York: Atheneum.

Behm, B., and V. Bonar. 1994. *Exploring forests*. Milwaukee, WI: G. Stevens.

Bix, C.O. 1982. *How seeds travel*. Minneapolis, MN: Lerner.

Bunting, E., and R. Himler. 1993. *Someday a tree*. New York: Clarion.

Cherry, L. 1992. *A river ran wild: An environmental history*. San Diego: Harcourt Brace Jovanovich.

DeYonge, S.C., P. Grosshauser, and B. Knaff. 2000. *Spring waters, gathering places*. Bozeman, MT: The Watercourse.

Gibbons, G. 2002. *Tell me, tree: All about trees for kids*. Boston: Little Brown.

Hiscock, B. 1991. *The big tree*. New York: Atheneum.

Hooper, M., and C. Coady. 1999. *The drop in my drink: The story of water on our planet*. London, England: Frances Lincoln.

Johnson, R.L., and P.V. Saroff. 2004. *A journey into a lake*. Minneapolis, MN: Carolrhoda.

Johnson, S.A. 1986. *How leaves change*. Minneapolis, MN: Lerner.

Kalman, B. 2005. *Forest food chains*. New York: Crabtree.

Kalman, B., and R. Sjonger. 2006. *The water cycle*. New York: Crabtree.

Kalman, B., and K. Smithyman. 2002. *The life cycle of a spider*. New York: Crabtree.

Kalman, B., K. Smithyman, and B. Bedell. 2002. *The life cycle of a tree*. New York: Crabtree.

Larson, G. 1998. *There's a hair in my dirt!: A worm's story*. New York: HarperCollins.

Locker, T. 1984. *Where the river begins*. New York: Dial Books.

Marshall, P. 2003. *From tree to paper*. Minneapolis, MN: Lerner.

McKinney, B.S., and M.S. Maydak. 1998. *A drop around the world*. Nevada City, CA: Dawn Publications.

Podendorf, I. 1982. *Trees*. Chicago: Children's Press.

Schweninger, A. 1991. *Autumn days*. New York: Viking.

Silverstein, S. 1964. *The giving tree*. New York: Harper and Row.

Smith, D.J., and S. Armstrong. 2002. *If the world were a village: A book about the world's people*. Toronto, Canada: Kids Can Press.

Tresselt, A.R., and H. Sorensen. 1992. *The gift of the tree*. New York: Lothrop, Lee, and Shepard.

chose the PLT curriculum because after reviewing the book, *The Environmental Education Collection: A Review of Resources for Educators, Volume 1* (NAAEE 1997), they felt that PLT's organization and emphasis on integrated, hands-on, minds-on environmental education was a good match for the school. In addition, all three curricula are aligned with national and state learning standards, and PLT had a known track record of success when used in other schools.

Curriculum Snapshot

The environment is a part of nearly every aspect of learning at the school. For example, the fourth grade's yearlong focus on horticulture provides opportunities for students to maintain the school's butterfly garden, cultivate and propagate plants in the greenhouse, and use the school's nature trail and outdoor classrooms.

The year begins with a favorite activity, "The Forest of S.T. (short-tailed) Shrew" (PLT 2006, see Internet NSTA Connection), in which students develop an understanding of forest diversity through the eyes of a shrew. That is, the students see the forest through the eyes of a child who is transformed into a shrew, a millipede, and a nuthatch. By seeing forest life (earthworms, beetles, spiders, trees, lichens, and more) through the eyes of these animals, the students gain a new perspective and appreciation for the world in which they live.

First, students conduct the read-aloud activity as a play and then they create a PowerPoint presentation that illustrates the animals described in the story. Afterward, students venture outside to the nature trail where the teacher introduces them to the "decomposition station," a learning station developed when an oak tree fell during a storm. Instead of having the debris removed, the teachers asked the Caddo Parish School Board to remove the smaller limbs and cut the larger trunk pieces into logs. The trunk of the tree is visible outside of the school fence. Wood chips were spread among the logs, and the area was left in a natural state for students to observe and learn from.

At the station, the students turn over the rotting logs and discover some of the real creatures depicted in the story. Children are instructed to roll the logs carefully and not to touch any of the organisms they may find underneath. The teachers explain that by rolling the log, they are lifting the roof from the homes of these animals and that we only want to observe, not disturb them.

To connect the story to habitats and decomposition, the teacher discusses the ecological role of each creature mentioned in the story. For example, the earthworms eat their way through the soil and separate out bits of plant material and other microscopic food particles from the soil. They are responsible for soil aeration. The white grubs drink juices out of the plant roots. The black beetle and carrion beetle eat the animals that die in the woods, so are important decomposers. S.T. Shrew also meets wood roaches, white termites, and pill bugs that eat decaying wood. The nuthatch, a bird, explores the world aboveground. Insects discussed in the story serve as a primary food source for birds like the nuthatch. Grasshoppers, wasps, flies, caterpillars, ants, and spiders are all busy doing their job of keeping nature in balance, providing a food supply for other organisms and taking organic matter to eat themselves.

Back in the classroom, students make flip-up window drawings of the habitats identified in the story, which integrates science, reading, and art skills into the activity. Students must hide at least five animals behind flaps in their correct habitat. The students love to lift the flaps to reveal their choices. The teacher uses the drawings to assess student understanding.

Language arts are also incorporated through reading connections that accompany the curriculum activities. These connections are important because environment-based science literature increases student understanding of issues while developing reading skills (Lieberman and Hoody 1998). Accordingly, the school's library is well stocked with books that further explore activities studied in class (Figure 1).

Going Further With Grants

To sustain and expand the school's environmental emphasis, faculty members have secured additional grants to help fund various environmental initiatives. Teachers actively search the internet for grant opportunities and prepare proposals. PLT, for example, provides grants up to $5,000 for service-learning community environmental projects. Once state agencies and businesses became aware of our interest and determination to provide opportunities for our students that stretched beyond our financial means, they began sending us information about available grants. These connections with professionals outside the school system have been invaluable to the school.

An oak tree that fell during a storm was left in place to create a "decomposition station."

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Outdoor learning is an integral part of the curriculum at this school.

For example, The Oil City Rotary Club learned of a 60 ft greenhouse that was available, and they donated the funds to buy it for the school. The Caddo Parish School Board sent maintenance crews to reconstruct it and add water lines to the greenhouse. A parent volunteer donated the electrical work and installed the heaters. Members of Shreveport Green (a nonprofit organization that works to improve the city's environment), parent volunteers, teachers, and the principal spent two days during the Christmas break leveling the ground, spreading gravel, building potting and storage tables, benches for the students, a work station for the teacher, and a dry-erase board. Also, this winter, the fourth-grade students developed a project in which they wintered houseplants for teachers. Once the news spread in the community, others were calling the school and asking about the program. The students ended up with over 75 ferns, pots of ivy, and tropical plants that they have cared for through the cold weather months.

The school was able to build a nature trail on school grounds through a Learn and Serve America grant. This award, along with other grants, enabled us to plant native trees and shrubs and to establish learning stations on the trail. The stations include an animal tracking station where students look for clues of nocturnal animals and use field guides to match the animal prints left behind; a bird-feeding station where students use binoculars and bird identification handbooks as they watch birds eating from berry-covered shrubs; and even an outdoor math lab where teachers conduct geometry activities with students, such as using math pegs to form shapes with large elastic bands (with younger students) and measuring the angles of shaped planters and comparing distances and angles between colored posts (with older students). In addition, the outdoor classrooms and learning stations provide students a tranquil setting in which to inspire creative writing and connect with nature.

The school's partnerships with organizations across the community have helped fund educational and service projects not just at the school but also at the local hospital, downtown, and throughout the community. For example, a pavilion on the shores of Caddo Lake includes interpretative signs designed by our fourth-grade students that depict an aquatic food chain and native wildlife. The pavilion is used by students from all area schools as a base for conducting water-quality tests and other science experiments.

In addition to these and other projects, students' environmental awareness has begun reaching beyond our community. The school participated in the Living Waters International Program (a program committed to providing safe drinking water to those in developing countries) and collected enough money to fund a well in Africa. Funds were also raised to help build two homes for tsunami victims in Sri Lanka, and five days after Hurricane Katrina, students took more than 500 snack bags to Shreveport to distribute to arriving hurricane evacuees. The experience of helping people in other countries as

well as in our own state has given our students a broader awareness of environmental, social, and economic issues.

Measurable Achievement

The success of the new environmental education focus and the activities that sprang from it brought recognition to the school. In 2004–2005, the school was recognized by the Louisiana Association of Business and Industry as one of the "Top 10" most improved schools in Louisiana. In 2006, the school received the National School Change Award sponsored by Fordham University Graduate School of Education, the American Association of School Administrators, and Pearson Education. Students have been invited to perform at the Louisiana Forestry Association Conference in Shreveport. In 2006, a fourth-grade teacher at the school, Brenda Smith, was named a National Outstanding Educator for Project Learning Tree.

Innovative changes in instruction can be observed daily within the school. Since the implementation of the environmental focus at the school, teachers and students take part in several field trips a year and use two outdoor classrooms, an outdoor math lab, a basketball court–size map of the United States, and a room-size floor map of Louisiana to make learning interesting and hands-on. Students have designed and constructed a rose garden and a vegetable garden, and they have recently planted plum, peach, pear, and may haw trees. Fourth-grade students make salsa from the tomatoes grown in the garden; special education students maintain concrete planters with seasonal flowers on the main street of Oil City; kindergarten students prepare coleslaw from the cabbage grown in the "Kindergarden"; third-grade students request water samples from lakes, rivers and bayous, adding the samples to a "Waters of Louisiana" fountain in the third-grade hall; finally this year, we added bird-watching to our list of science activities—students from all the grades sit in the outdoor classroom and enjoy watching and identifying the birds that stop to visit our bird-feeding station on the opposite side of the field.

Test scores are also improving. In 1999, when Louisiana first began assigning a school performance score (an academic rating), the school's score on the Iowa Test of Basic Skills was 26 points below the state school performance score average. The school has now reached a score of 89.0, an improvement of 48.6 points, surpassing the state average. These scores and academic successes would have only been a dream a few years ago but now are a trademark of the school. The teachers often speak of the tapestry of change that transformed the school—the weaving together of a dedicated staff, willing students, concerned community, and supportive parents with Project Learning Tree and other environmental education programs has created a promising future for the school. ■

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Content Standards
Grades K–4
Standard C: Life Science
- The characteristics of organisms

Standard F: Science in Personal and Social Perspectives
- Changes in the environments

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Resources

Lieberman, G.A., and L.L. Hoody. 1998. *Using the environment as an integrating context for improving student learning*. Poway, CA: State Education and Environment Roundtable.

National Research Council (NRC). 1996. *The national science education standards*. Washington, DC: National Academy Press.

North American Association for Environmental Education (NAAEE). 1997. *Environmental education collection: A review of resources for educators, volume 1*. Washington, DC: Author.

Project Learning Tree (PLT). 2006. *Project Learning Tree: PreK–8 environmental education activity guide*. Washington, DC: PLT/American Forest Foundation.

Internet

Project Learning Tree
www.plt.org
Project Wild
www.projectwild.org
Project WET
www.projectwet.org

NSTA Connection

To access a sample PLT activity, "The Forest of S.T. (short-tailed) Shrew," click on this article at *www.nsta.org/elementaryschool#journal.*