

School Gardens Grow Science Achievement Scores

INSIDE SCOOP—Thinking of integrating gardening into your curriculum? This article explains why it's a good idea.

by Debra Shapiro

Science educators have long recognized the value of school gardens in motivating students to study science. Recent studies show that school gardening programs also boost students' scores on science achievement tests.

Cynthia Klemmer, director of education and development at the National Gardening Association; T.M. Waliczek, an associate professor at Texas State University; and J.M. Zajick, professor of horticultural sciences at Texas A&M University, studied 647 third, fourth, and fifth graders from Temple, Texas. As part of their science curriculum, students in the experimental group participated in school gardening activities and received traditional, classroom-based science instruction, while teachers of students in the control group taught science using traditional methods only.

The American Society for Horticultural Science's publication *HortTechnology* contained an article that summarized the results of Klemmer's study. The study found that students in the experimental group scored significantly higher on the science achievement test compared to the students in the control group. The article pointed out that "no statistical significance was found between girls and boys in the experimental group, indicating that gardening was equally effective at teaching science for both genders."

A similar study by Leanna L. Smith and Carl E. Motsenbocker of Louisiana State University AgCenter's Department of Horticulture also confirmed that "once-weekly use of gardening activities and hands-on classroom activities helps improve science achievement test scores." To

learn more about these and other studies of school gardening programs and their effects on science scores, refer to www.electronicipc.com/JournalEZ/toc.cfm?code=0420003 (select the July–September 2005 edition of *HortTechnology*).

The school gardening program examined in the Texas and Louisiana studies is the Junior Master Gardener® (JMG) program, an international 4-H youth development program of the University Cooperative Extension network (and modeled on the adult Master Gardener® program). Aimed at grades 3–8 and created by teachers and horticultural professionals, the

JMG curriculum covers science, horticulture, and the environment and correlates to state teaching standards. The curriculum addresses such topics as plant growth and development; photosynthesis; soils and water; ecology and environmental horticulture, insects and diseases; landscape horticulture; and the interdependent relationships among living things. Group hands-on activities integrate math, science, language arts, and social studies.

JMG's newest curriculum, *Literature in the Garden*, can help educators of grades 3–5 use the garden as a means to get students interested in reading. The curriculum has 34 related activities developed around six award-winning children's gardening books: *Plantzilla* by Jerdine Nolen; *Miss Rumphius* by Barbara Cooney; *Brother Eagle, Sister Sky* by Susan Jeffers; *The Gardener* by Sarah Stewart; *Tops and Bottoms* by Janet Stevens; and *Weslandia* by Paul Fleischman.

The program also offers "independent and group learning experiences, life/skill and career exploration, and service learning opportunities for youth." Students who complete the program are recognized with certification as Junior Master Gardeners.

Students can participate in JMG through schools, homeschools, after-school programs, or youth clubs. An

outdoor garden is not required; schools without space for an outdoor garden may use indoor container gardens.

At www.jmgkids.us, teachers can learn more about the curriculum, take a tutorial about the different components of starting and leading a JMG group, find out how to start a school garden, access grant information, and see when and where the program's optional training sessions will be held.

Teachers usually need help starting and maintaining school gardens. They can receive this assistance from volunteers such as parents, older students, senior citizens, garden club members, Master Gardeners, or interested community members. Often these individuals are able to help maintain the school garden over the summer. To locate Master Gardeners in the United States and Canada, see the interactive map at www.ahs.org/master_gardeners/index.htm.

Activities for grades K–8 in the NSTA best seller *Bottle Biology: Exploring the World Through Soda Bottles and Other Recyclable Materials* include designing a gardening system. Students use film canisters to grow tiny gardens, and they can perform individual experiments on germination, gravitropism, and phototropism. Visit <http://store.nsta.org> for more details.

The Teacher's Room at the National Gardening Association's (NGA) www.kidsgardening.com provides gardening resources such as "All About Plants" articles, activities, a school greenhouse guide, a hydroponics guide, a school garden registry, classroom stories,



These students participated in the Junior Master Gardener program of University of Wisconsin-Extension, Fond du Lac County, Wisconsin, in 2005. Studies show the program fosters environmental awareness and increased interest in science.

and teaching strategies. NGA's *From Seed to Seed: Plant Science for K–8 Educators* is an online professional development course for teachers seeking to incorporate botany and gardening into their science curriculum; NGA also offers other online courses for educators. The association's website informs teachers about upcoming events, grants, awards, and fundraising ideas and enables teachers to register to receive free newsletters. NGA also sells various gardening-related educational materials.

Washington State University's *Growing with Plants* curriculum for primary grades blends nutrition education, plant science, and ecology. Its nine lessons feature simple science experiments and hands-on activities. Teacher background material includes a guide for starting school and community gardens. Consult www.pierce.wsu.edu/nutrition/gwp for more information.

Other sources of gardening education information are The Nature Conservancy (<http://nature.org>), The American Horticultural Society (www.ahs.org), and the United Kingdom's Royal Horticultural Society (www.rhs.org.uk). ●