

School Gardens Plus Nutrition Lessons Equal Science Literacy

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Recent studies show that schools with vegetable and fruit gardens are successfully combining nutrition lessons with science, and students are reaping the benefits.

“Gardens can be a powerful strategy for enhancing classroom instruction not only in basic science, but also in ecological literacy and nutrition,” says Daniel Desmond, University of California Cooperative Extension adviser emeritus and food and society policy fellow. “The current childhood obesity crisis has many of the over 3,000 school gardens in California focusing on the science of nutrition. School gardens have demonstrated a unique ability to develop a relationship between children and their food, resulting in a change in dietary habits, nutrition, and health,” he explains.

“There are a growing number of models nationwide where children are engaged in hands-on science (nutrition) education in a school garden and get connected to local food systems through Farm to School programs,” notes Desmond. (Learn more the National Farm to School Program at www.farmtoschool.org.) He adds that schools are increasingly “considering redefining their school kitchen as a learning laboratory.”

An August 2006 analysis conducted by the School Nutrition Association found that “from Los Angeles to Brownsville, Texas, most of the nation’s 100 largest school districts by enrollment are requiring nutrition education,” and 6% of these districts had school gardens. The districts account for 16% of the schools, 21% of the teachers, and 23% of the nation’s K–12 students, according to the National Center for Education Statistics.

Desmond points to two studies that examined the garden/nutrition/science connection. Results of a study published in the January 2002 issue of the *Journal of the American Dietetic Association* demonstrated how combining learning activities in a school’s vegetable garden with nutrition lessons gave teachers a chance to incorporate science in the curriculum, with an added bonus: Students became more willing to try different vegetables.

Three fourth-grade classes from three schools participated in the study, which was conducted by Jennifer Morris and Sheri Zidenberg-Cherr of the



University of California, Davis. Participating teachers used nutrition lessons that covered such topics as “plant parts, nutrients, Food Guide Pyramid, serving sizes, food labels, physical activity, goal setting, consumerism, and snack preparation.” Each lesson had a garden component that incorporated science activities such as seed planting, worm bottles, weed identification, bug boxes, garden fertilization, seed dispersal, butterfly studies, and crop harvest.

Students at the first school, which served as the control site, received no formal nutrition or gardening education. Students at the second school were taught only the nutrition lessons. At the third school, students studied nutrition and did hands-on garden/science activities.

The study showed that students who were exposed to the nutrition lessons increased their preference for several vegetables, but the students who studied nutrition and did hands-on science in the garden became willing to try many more vegetables, including vegetables that were not grown in their garden. The researchers noted that this positive effect lasted six months after the lessons were completed. “These results lend support to the inclusion of vegetable gardens within the school setting,” they concluded.

In 2004, University of California’s journal *California Agriculture* reported on another study of garden-based education, this time involving a Davis, California, program called the Davis Farm to School Connection (see article at <http://calag.ucop.edu/0404OND/pdfs/healthySchools>).

[pdf](#)). The program “sought to promote the development of lifelong healthy eating habits in children and to create a school environment that made connections among the school garden, cafeteria, and classroom and linked them to local agriculture.” The incorporation of agriculture into the school curriculum gave teachers an avenue to discuss both food and science concepts “important to planetary health, such as composting and recycling.”

Students participating in the program learned healthy eating habits by participating in “the full cycle of life from seed to table and back again,” observed researchers Heather Graham, Gail Feenstra, Ann M. Evans, and Sheri Zidenberg-Cherr. Because they studied nutrition and waste management practices, such as composting, students correspondingly became less likely to waste food, according to food service staff at the participating schools. The researchers also noted that such environmentally based learning has resulted in higher student grades and better test scores.

Of the teachers participating in this study, 66% reported that science was taught using nutrition. Most teachers used the garden to teach subjects such as science (90%), nutrition (71%), environmental studies (60%), agricultural studies (57%), and math (56%). Sixty-four percent linked the garden to language arts by having students do journal writing in the garden and connecting the garden with literature. Teachers also reported that field trips to farms provided hands-on learning opportunities and helped students make connections among the garden, the school cafeteria’s salad bar, recycling, and the food and farming system.

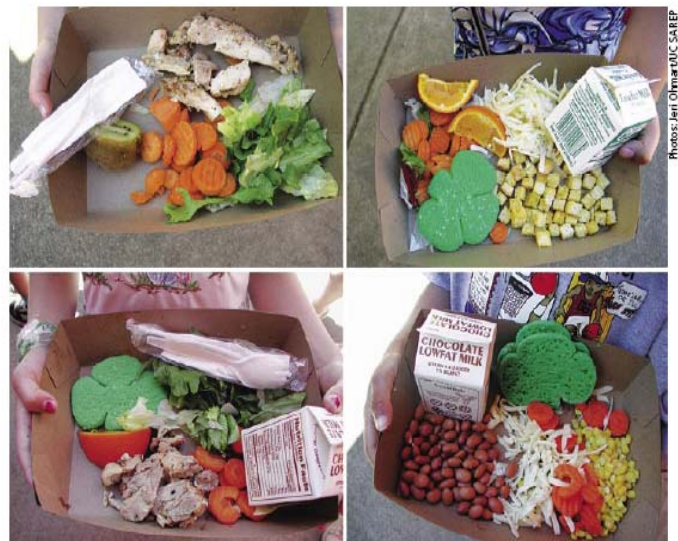
The Food and Drug Administration (FDA) and NSTA have partnered to establish a professional development program in food science consistent with national science standards. As part of this program, FDA and NSTA conduct a Food Safety and Nutrition symposium at NSTA conferences. The symposium immerses teachers in food topics, including the Nutrition Facts Label. “The program shows teachers how to use the Nutrition Facts Label to assess the nutritional content of meals and gives them Nutrition Facts Label activities using the engaging topic of food that they can take back to their students,” says Louise Dickerson, FDA’s project officer for the program. Learn more at www.nsta.org/fda. The FDA/NSTA Science and Our Food Supply website at www.foodsafety.gov/~fsg/teach.html also offers information and free resources. (See page 24 of the February 2007 issue of *NSTA Reports* to learn about

FDA’s online nutrition program featuring “Labelman.”)

Teachers looking to start a school vegetable garden should visit the how-to section of The Edible Schoolyard website at www.edibleschoolyard.org/homepage.html. Originated by chef and author Alice Waters, The Edible Schoolyard is an award-winning nonprofit program located on the campus of a Berkeley, California, middle school.

The NSTA Press® two-part book set *Garden Genetics: Teaching With Edible Plants* uses activities and inquiry-based experiments with familiar foods to teach genetics while helping students make connections to ecology, evolution, plant biology, and social science. The set, which includes both teacher and student editions, is adaptable to biology students at all levels. Consult <http://store.nsta.org> for more information.

NSTA members who want to teach about nutrition but are unable to have a school garden will appreciate “From Garden to Table,” an article from the March 2006 issue of *Science & Children*. The article explains how an urban science teacher living “in a climate with cold winters and no access to garden plots” can teach students about the food system. The March issue also contains other articles with the theme “Health, Nutrition, and the Human Body.”



In Davis elementary schools, children can choose what they want for lunch from salad bars stocked with healthy fare, including fruits and vegetables supplied by regional growers.