

“ Learning comes alive in a school garden! All subjects can be taught in this dynamic hands-on environment. From reading to science, math to nutrition, it’s all possible. With bales of straw as chairs, clipboards as desks, and the garden as their classroom, students’ textbook lessons come to life as butterflies metamorphose, worms decompose, plant growth is recorded, fresh corn is eaten, and sensory poetry is created.

California Academic Content Standards are growing, too! Everything we know about good teaching is magnified in a school garden: student engagement, meaningful and relevant lessons, use of manipulatives, cooperative learning, and exploration and discovery. There is no better environment than the garden in which to plant the seeds of knowledge, experience the joy of learning, and harvest a bountiful crop of lifelong learners.”

Martha Deichler, Principal
Vista Square Elementary School,
Chula Vista, CA

California Department of Education



Introduction to School Gardens

What is a school garden? A school garden is an innovative teaching tool and strategy that lets educators incorporate hands-on activities in a diversity of interdisciplinary, standards-based lessons. The garden engages students by providing a dynamic environment in which to observe, discover, experiment, nurture, and learn. It is a living laboratory where lessons are drawn from real-life experiences rather than textbook examples, allowing students to become active participants in the learning process. Through the garden, students gain an understanding of ecosystems, an appreciation for food origins and nutrition, and knowledge of plant and animal life cycles. At the same time, they learn practical horticultural skills that last a lifetime.

Where did school gardens come from? The school garden movement originated in Europe and arrived in the United States in the 1890s. Gardens sprang up at schools all over the country during the early 20th century, with particular booms as Victory Gardens intended to increase the food supply during World War I and World War II. During the 1950s, the number of gardens decreased as schools placed more emphasis on technology. However, the environmental movement of the 1970s renewed educators’ interest. More recently, the popularity of school gardens as an educational tool has steadily grown as a way to teach healthy eating behaviors and a way to incorporate and increase hands-on learning experiences in interdisciplinary lessons.

What does a school garden look like? School gardens come in all shapes and sizes, with a common focus on growing plants. A school garden may be as small as a few pots of herbs growing on a windowsill or as large as a half-acre plot of vegetables in a schoolyard. Gardening programs are flexible enough to fit the needs and resources of every school.

Why garden with kids? Educational philosophers going back to the 17th century have promoted the use of gardening to achieve learning objectives and support the mental, emotional, and social development of youth. Students enjoy gardening activities, and teachers and parents say that gardening programs:

- Address multiple learning styles
- Provide opportunities for interdisciplinary lessons
- Improve environmental attitudes
- Promote good nutrition and exercise
- Teach patience and responsibility
- Instill a positive work ethic
- Increase students’ self-esteem
- Build classroom relationships, improve teamwork, and strengthen school spirit
- Beautify the environment



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In addition to anecdotal evidence, a growing body of research-based literature supports the use of youth gardens as a beneficial teaching tool. Research has found that participation in youth gardening programs can have the following impacts on students:

- Improve self-esteem and attitudes toward school¹
- Improve social skills and behavior²
- Improve environmental attitudes, especially in younger students³
- Increase group cohesion⁴
- Improve interpersonal relationships^{5,6}
- Increase interest in eating fruits and vegetables and improve attitude toward fruits and vegetables⁷; improve attitude toward vegetables and toward fruit and vegetable snacks⁸
- Significantly increase science achievement scores^{9,10}
- Increase self-esteem, help develop a sense of ownership and responsibility, help foster family relationships and increase parental involvement¹¹
- Improve life skills, including working with groups and self-understanding¹²

When investigating the benefits of school gardens, it is helpful to divide them into four categories: academic achievement, a healthy lifestyle, environmental stewardship, and community and social development.

Academic Achievement

Academic achievement is the primary focus of educators throughout the country. Their aim is to ensure that students perform at satisfactory levels defined by



local, state, and national academic standards. All lessons and activities must complement mandatory standards to merit the use of valuable classroom time.

A school garden is a perfect tool to provide hands-on learning experiences for any academic subject. Science is the most common subject linked to gardens. Many teachers use the garden as a laboratory to introduce students to scientific methods through plant-related experiments. Additionally, a garden provides a place to study weather, insects, soil, and other environmental matters. It's the ideal habitat model for studying ecosystems. Real-life garden experiences contribute greatly to students' comprehension and retention of new science knowledge; in fact, participation in a gardening program increases science achievement scores, as noted above.

In addition to science, the garden provides opportunities to teach mathematics, history-social science, English-language arts, and visual and performing arts. Concepts that seem abstract in the classroom come alive in a garden setting. For instance, students find taking daily measurements of garden bean plants and then charting the growth rate to determine the fastest-growing plant in the garden much more exciting than charting numbers provided by a textbook. Chapter 3, Linking Gardens to School Curriculum, provides additional details and specific examples of how to integrate gardening activities into the classroom.

A Healthy Lifestyle

Beyond academics, the garden provides broader life lessons, including contributing to students' knowledge of how to maintain a healthy lifestyle. California is

“You are what you eat.”
Anonymous



Alicia Dickerson/Life Lab

PROGRAM SPOTLIGHT

Growing Students in the Garden

Pacific Elementary School, Davenport, CA

Established in 1982, the Life Lab at Pacific Elementary is an integral component of the school year for all students. “It is wonderful to witness the excitement of the students to go to the garden,” shares Life Lab Coordinator Jerry Adame. “If I am a minute late to pick them up for class, when I arrive they anxiously ask, ‘Where have you been?’”

The project blossomed from a few raised beds near the playground into a 50- by 100-foot discovery garden including herbs, vegetables, fruit trees, ornamental beds, a composting area, and a number of storage structures for tools and supplies. During their weekly garden visits, students participate in science lessons and tend a 5- by 10-foot raised bed in which they grow salad greens, herbs, and other edible plants. Additionally, Jerry makes sure students have at least 10 minutes to explore the garden on their own, so they have time to independently “feel, taste, and smell the beauty of the garden.” When their gardens are ready to harvest, the students carefully pick, clean, and package their produce and then walk it up to the school’s kitchen, also known as the Food Lab.

An extension of the garden, the Food Lab program was added in 1984 as a coordinated effort to provide students with an



Alicia Dickerson/Life Lab

Hands-on, curriculum-based, comprehensive education programs like this one are important for changing the eating behaviors of our society both now and in the future.

opportunity to be a part of the full food cycle, from seed to table. On their day in the Food Lab, students spend an hour and a half in the kitchen helping to prepare the school’s lunch. The lab begins with a job assignment where students can serve as the manager, baker, prep person, or cook. Each role allows them to practice different academic and life skills, including mathematics and safe food handling procedures. It also prepares them for potential career

opportunities in the food industry. Through repeated experiences, students gain confidence in their abilities; through job assignments, they gain leadership skills. Beyond that, since the other students and teachers rely on them for their meal, they are given a unique opportunity of responsibility and ownership.

Food Lab Nutrition Coordinator Stephanie Raugust says that two of the most important aspects of the programs are ties to the curriculum

and the opportunity for students to practice important life skills. Through the garden, students gain an understanding of and appreciation for the cultivation of food crops, along with a respect for local farmers. They also learn valuable science concepts through observation and experimentation. By learning to prepare nutritious meals, the students are armed with the knowledge and skills to maintain a healthy lifestyle.

The school is solidly invested in both programs. Hands-on, curriculum-based, comprehensive education programs like this one are important for changing the eating behaviors of our society both now and in the future. Strong support from parents, teachers, administrators, and the community ensure such programs will continue to grow and thrive.



“Incorporating agriculture into the classroom helps students understand how humans interact with the environment and how food is grown. Further, agriculture and school gardening promotes awareness of healthy eating, helps students master science concepts, and exposes students to agricultural job opportunities. By designing, cultivating, and harvesting school gardens, students experience deeper understanding of natural systems and become better stewards of the earth.”

Lance Omeje, Teacher
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experiencing a major health crisis as the number of overweight and unfit youth grows at an epidemic rate. Approximately one in three children is overweight or at risk of becoming overweight, and almost 40 percent of school-age children are considered unfit. The increase in number of weight-related chronic diseases such as diabetes is of great concern, and the need for prevention education is critical.

Garden programs work to combat the epidemic by teaching youth about healthy lifestyles that include proper nutrition and physical activity. Through a gardening program, students gain first-hand experience with fresh fruits and vegetables. They discover that produce does not magically appear on the grocery store shelves, and they learn the important role of agriculture in our society. The pride and curiosity sparked by growing fruits and vegetables along with the knowledge of where they come from motivates students to try eating them, oftentimes leading to more positive attitudes and eating behaviors. Fruits and vegetables are an important part of the diet not only because they provide essential vitamins, but also because they are linked to prevention of such health problems as cancer and heart disease. Studies show that a majority of children do not eat the recommended amount of fresh fruits and vegetables each day, so they are missing out on these benefits. A garden program increases produce availability and creates opportunities to teach students what they should eat for good health through fun, hands-on experiences. This information can also be shared with students' families.

A healthy lifestyle is more than just eating right, though. Students also need to adopt good exercise habits. The garden provides a wide range of physical activity through digging, planting, and weeding. The garden activities are often so captivating that students do not even realize they are exercising. And unlike some other activities they participate in during their school years, gardening is an activity they can participate in for the rest of their lives.

Environmental Stewardship

A school garden is a powerful environmental education tool. Through gardening, students become responsible caretakers. They have an opportunity to engage in agricultural practices on a small scale, learning about the responsibilities and impacts of land cultivation. They explore the web of interactions among living and nonliving components of life. By doing so, they develop a greater understanding of the natural world.

Students also learn the importance of caring for natural resources. A garden of native plants or drought-tolerant plants, for example, provides an excellent opportunity to teach students about water conservation. They will observe that choosing the right plants and irrigation for the garden results in a beautiful



Photos: S. A. Day

landscape that is also environmentally friendly. Additionally, gardens teach about waste reduction through composting. Students who learn sustainable garden practices can more readily consider conservation issues from a local and global perspective.

For many children, a garden offers the only chance to get close to nature. Some lack access to gardening spaces because of their living situations; others have limited exploratory free time outdoors. School garden educators in urban environments frequently find their programs provide students their first opportunity to dig into the soil and watch a plant grow.

Establishing a connection with nature at an early age is extremely important. Researchers have discovered that childhood experiences with nature are strongly linked to adult attitudes toward plants. Participation in gardening during childhood is the most important influence on adult environmental attitudes and actions, and even in urban areas where green spaces are limited, gardening programs for children can provide a strong enough connection to instill appreciation and respect for nature in adulthood.¹⁵

Community and Social Development

Community and social development lessons do not receive the attention that academic achievement does, but they are as crucial to the survival of our country as reading and writing. Children must learn how to take responsibility for their environment and develop a strong sense of community to ensure the continuation of our society.

Gardens create opportunities for students to work cooperatively and to develop responsibility. They will quickly learn the negative consequences associated with forgetting to water their plants on a hot day and will work hard to make sure it does not happen again. Plants will also provide positive reinforcement in response to proper care by growing or producing fruits. On a personal level, gardening builds confidence, self-esteem, and pride as students watch their efforts



Alicia Dickerson/Life Lab

“We are part of the earth
and it is part of us....
What befalls the earth
befalls all the sons of the earth.”

Chief Seattle, 1852

I have never seen children work as collaboratively as they do when they are in the garden. As they face the multitude of problems associated with growing flowers and vegetables, they all work, share ideas, and solve problems together as they strive to reach a common goal. It never ceases to fill me with joy as I watch true learning at its best just happen.

Cathey Anderson, Teacher
Valley Center Elementary School
Valley Center, CA



Debbie Delatour

turn into beautiful and productive gardens. It also teaches them patience as they wait for a seedling to sprout or a tomato to ripen.

Gardens provide unique opportunities for cross-generational connections. While gardening, children interact with teachers, parents, and community volunteers, providing opportunities for social interaction that are often lacking in our society. The garden allows children to ask questions, share thoughts, and work cooperatively toward a common goal. In addition, school gardens give children the opportunity to showcase their products at local fairs. For information on how to submit entries, see Resources (page 93) for Web links to California's fairs and expositions.

Through gardening, students help to beautify the school grounds. Some will find it their only chance to contribute positively to their environment. The praise they receive from other students, parents, teachers, and community members will create a sense of community spirit and introduce them to the benefits of volunteering.

Above all, gardening is fun, and once the skills are acquired it can become a lifelong hobby. Exploring the outdoors, planting in the soil, watching seeds grow, and harvesting the bounty are enjoyable and memorable ways for students to spend their time.

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