

The Academic Benefits of a Garden-Based Curriculum

Part One: Physical and Biological Sciences

School gardens can be enormously beneficial components of K-12 education. The aesthetic benefits of School Gardens are self-evident, but the more important impact of the school garden is its quantifiable contribution to academic achievement, healthy social interaction, ecological consciousness and personal nutritional responsibility. In this series of one-page briefs, we will cite and explain the evidence in support of these benefits.

One of the most powerful effects of garden-based learning is an increased aptitude for the natural sciences. As a matter of course, students who work with a school garden are directly exposed to a variety of plants. This exposure provides a great opportunity for education about plant biology and the process of growth. This, however, is only one dimension of the tangible benefits of garden-based learning. Introducing structured horticultural instruction into the classroom has also improved standardized test scores across the board. These are just a few examples of studies which have demonstrated the considerable impact of school garden curricula on science achievement tests:

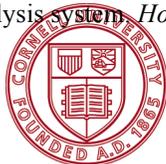
- Science achievement of 3rd, 4th, and 5th grade students was studied¹ using a sample of 647 students in Temple, TX. Of the two control groups, one combined gardening activities with science instruction; the other used only science instruction. The experimental groups scored significantly higher on the science achievement test.
- The Junior Master Gardener curriculum was introduced once per week for two hours in three Louisiana elementary schools.² Texas A&M science achievement tests were administered pre-and post-intervention. Results showed a significant difference between the experimental classes' pre-test and post-test scores, while there was no significant difference between the pre-and posttest scores of control classes.
- Hands-on environmental education programs were introduced into several schools³ for the purpose of evaluating their efficacy. Results for schools with such programs show better performance on standardized measures of academic achievement in reading, writing, math, science and social studies. Classroom behavior improved, as well.
- The objective of a 2003 study⁴ was to investigate the impact of an outdoor environmental program on elementary school students' creative and critical thinking and attitude toward these two subjects. Results indicated that students learned math and science content and were also thinking at the higher levels of synthesis and evaluation within the theoretical framework of Bloom's taxonomy.

¹ Klemmer, C.D., Waliczek, T.M., & Zajicek, J.M. (2005). Growing minds: the effect of a school gardening program on the science achievement of elementary students. *HortTechnology*, 15(3), 448-452.

² Smith, L., & Motsenbocke, C. (2005). Impact of hands-on science through school gardening in Louisiana public elementary schools. *HortTechnology*, 15(3), 439-443.

³ Lieberman, G.A., & Hoody, L. (1998). Closing the achievement gap: using the environment as an integrating context for learning. *Sacramento, CA: CA State Education and Environment Roundtable*.

⁴ Waliczek, T.M. (2003). Exploring impact of outdoor environmental activities on children using a qualitative text data analysis system. *HortTechnology*, 13(4), 684-688.



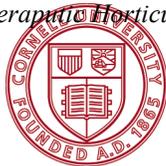
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- In yet another study,⁵ children who participated in horticultural activities demonstrated more group cohesiveness and more knowledge of plant anatomy than those who did not participate in the activities.

Overall, the academic consequences of implementing a school garden curriculum are plentiful and overwhelmingly positive. An excellent guide illustrating age-appropriate activities by grade is available from the [California Department of Education](#).

⁵ Bunn, D.E. (1986). Group cohesiveness is enhanced as children engage in plant stimulated discovery activities. *Journal of Therapeutic Horticulture*, 1. 37-43.



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