

Life Lab Science at Gateway School: A Model for Year-Round School Garden Planning

Fall

- All grades plant a "salad in a box."

Spring

- K: Popcorn
- 1st: 3 Sisters
- 2nd: Salsa Garden
- 3rd: Spaghetti Squash, Pesto, and Tomato Sauce Gardens
- 4th: Pizza garden
- 1st and 4th: Wheat for tortillas and pizza dough

Year-Round Garden Club

- Group and individual garden projects (students choose!)

Life Lab science at Gateway school provides children with a real-life, hands-on opportunity to study the natural sciences in our ¼ acre garden classroom. Our outdoor learning environment is an ideal setting for scientific investigation, fostering children's natural curiosity about the world around them. The program seems to touch a long neglected place in those of us raised exclusively inside school walls, where science was something we often only read about in textbooks. "Wow, I wish my education could have been like this," is often heard from adults visiting our living laboratory.

Our Life Lab program has a strong environmental science focus with an emphasis on sustainable agriculture practices, ecological pest management, tree planting, native plant restoration projects, eco literacy, school wide waster reduction, recycling and composting programs and community service and education.

The curriculum is aligned with the National Science Framework. Within the context of a garden, a thematic teaching approach is used to integrate life, earth, and physical sciences at all elementary grade levels. Our garden classroom provides a safe environment for both girls and boys to succeed equally in science, while also appreciating cultural and learning style differences. Each child can find her or his own individual challenges and successes.

During classes, students learn to use a variety of lab instruments and tools. At different grade levels they read and record temperatures, collect data on insects, measure and weigh materials, view macro and microorganisms, do soil chemistry, plant organic food and flower gardens, and more. Using the scientific method, students design and monitor experiments, make observations, do research, and analyze results.

Each fall students, Kindergarten through 4th grade plant, study and maintain a "salad-in-a-box" garden. Then we celebrate spring and their efforts in organic agriculture

by harvesting and preparing a salad feast. For example, the children might grow ½ dozen varieties of lettuce, carrots, broccoli, kale, celery, radishes, fennel, kohlrabi, cilantro, chervil, parsley, spinach, spring onions, edible flowers (calendulas, Johnny jump-ups, borage), and culinary herbs. Their salad feasts are abundant, beautiful and nutritious!

Come spring, students plant different theme gardens depending on the grade levels. Kindergarteners grow popcorn, (1st) three sisters garden (corn, beans and pumpkins), (2nd) salsa garden, (3rd) spaghetti squash pesto and tomato sauce gardens, (4th) pizza gardens. Wheat is planted by 1st and 4th graders then is processed in the fall for tortillas and pizza dough. The whole school is also involved in the threshing, winnowing and grinding of the wheat to make bread for our Peace and Plenty celebration and all grade levels grow 9 different sprouts for our Promise and Renewal spring celebration. Our beautiful outdoor “green” kitchen facility allows children to prepare their garden grown produce into delicious and nutritious meals.

The students also grow organic produce, ornamental and edible flowers and propagate plants that they sell at our school fall and spring festivals. This provides children with many opportunities to use and expand their math skills and the knowledge they gain in Life Lab of natural science and sustainable agriculture enables children to give detailed explanations to their curious customers. These real-life activities and experiences increase the children’s awareness of all that goes into the growing and marketing of the food they eat. Students who otherwise may not be exposed to farming may come to see the value of the farmer in our society. This process of children sharing their efforts with the community validates their educational experiences as an important part of the real world, and is an integral part of our Life Lab science program at Gateway.

A major focus of our Life Lab is the children’s group and individual garden projects, enacted during the lunchtime garden club. These child-directed learning situations provide a wonderful opportunity for students to use their communication, cooperation, conflict resolution and problem solving skills in their relationships as well as in science. Children’s gardens are more of a process than a product, as you may notice when you wander through the garden. Real education like gardens cannot always be presented as a neat finished package, but can be experienced as a vital work in progress.

The skills children are developing in our Life Lab garden are not only seen in their detailed journal entries, but may be seen in the devotion they give to a small garden plot, or the care they show for the tiny garden creature that might cross their path, or in the way they confidently approach a problem always asking questions and trusting themselves to find solutions. This is the essence of Gateway school’s Life Lab science program in action.

The following are the grade level science themes and general concepts studied:

- Changes: Second graders explore patterns of change by learning the conditions and connections affecting living and non-living things. Children study the physics of air by

testing to see if air takes up space, has weight, and pressure. They learn the importance of California native plants with seasonal visits to our own native plant garden and by propagating their own California oak trees from seed. They observe and identify producers and consumers in interdependent food web systems.

Structure and Function: Third graders become meteorologists with in depth weather studies. They do family interviews to learn about weather conditions around the world, then do research about extreme weather conditions and set up and monitor experiments. They might test the effects of pollutants on a watershed model, test evaporation rates of a variety of liquids, monitor different sized rain gauges, observe percolation rates, or test temperature effects on seed germination and plant growth. They also learn how to read and record data from a variety of instruments in our weather station. Third graders also discover that a shovel is a simple lever and experiment with the physics of digging by adjusting the board, load and fulcrum to make the effort more efficient.

Interactions: Fourth graders learn that matter has physical properties that can be changed through various interactions with the environment. Students complete several experiments demonstrating the concept of photosynthesis. They observe the absence of chlorophyll in plants, which have been deprived of sunlight, learn that carbon dioxide and water is absorbed during this chemical process, and see extra oxygen bubbles being released from an aquatic plant as it absorbs CO₂ when exposed to sunlight. They also explore the concepts of capillary action and transpiration and discover how much water a single leaf can transpire. Students experiment with pH indicator and do soil chemistry tests for soil nutrients (NPK). The Monarch butterfly life cycle is monitored and observed in the garden and habitat studies take place during our field trips to Lighthouse Field.

Adaptation and Evolution: Fifth graders have half a year of Life Lab science. They study the concepts of adaptation and evolution. They define a habitat, then identify and describe adaptations that help particular plants and animals survive in their specific habitat. Students use microscopes to observe physical characteristics of various plants and animals and then they speculate as to why those traits might have been advantageous to the organism's evolution. Students discover one of their own unique adaptations when they attempt simple tasks without their thumbs. The semester culminates with a micro habitat "discovery" of their own unique species they design and build with special adaptations for survival.

The Medicinal Use of Plants: Middle School Elective.

The concept of using food as medicine is explored in this elective. We make our own tinctures, salves, lip balm, herbal oil and vinegar, sun teas, lotions and more during this elective. Most plants used in this class are grown and harvested from our life lab garden. Students research the traditional uses and medicinal qualities of plants and record recipes.

See you in the garden!

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