

## INTEGRATING THE GARDEN INTO YOUR CURRICULUM

### Introduction

We know with pressure on teachers to meet California State Standards, it is hard to find time for students to maintain and use the school garden. Here are suggestions for using garden time to meet curriculum standards in addition to learning about basic gardening principles. We also suggest you refer to *A Child's Garden of Standards* for ideas incorporating Standards at specific grades 2-6 for different curricular areas. Click this link

<http://www.cde.ca.gov/re/pn/rc/ap/pubdisplay.aspx?ID=001579> to get to the listing of publications. Click on C, scroll down to publication 001579, click on *Child's Garden of Standards* to view the publication. Click this link <http://www.cde.ca.gov/re/pn/rc/orderinfo.asp> for ordering information.

### Language Arts



### Reading

Many books for children, both fiction and non-fiction can be found in the school library and in the reference section of our website that focus on the garden or garden related subjects. [Click here to link to School Garden References for a list of books.](#) In addition, the garden can be the location for “Read Outs,” partner or “Buddy” reading, cross-age reading tutorials, and individual sustained silent reading. A garden can be designed to incorporate the theme from a book (e.g., *Peter Rabbit*) with references to the book or literary series throughout the garden. Larger gardens can incorporate a different book for different grade level plots or raised boxes within the garden. Book posters can be a part of the garden, either laminated or protected on roofed kiosks. Include reading nooks, hay bales, benches, etc. to promote the pleasure of reading in the garden.

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### Writing

With a simple clipboard, the garden becomes a wonderful arena for creative and journal writing. Any writing assignment will be fun when the students are outside in a garden. Students might interview a classmate, work on a collaborative story, play, or group report in the garden where their talking does not interfere with others in a classroom. Other garden ideas that easily fit into writing curriculum requirements are:

- Alphabet- A garden of letters and phonics for young learners (S is for soil, sunflowers, etc.)
- Poetry- Structured poetry, especially, draws inspiration from the garden. Try haikus, cinquains, five senses poems (i.e. I see..., I hear..., I smell..., I taste..., I feel..., I know...,) and concrete poetry.
- Journal writing- Journals are excellent tools for maintaining permanent records of children's experiences in the garden. Creating a journal provides an opportunity for the child to use his or her observational, imaginative, expressive, and artistic skills. Making regular entries in a journal helps develop a child's writing and observation skills and provides information from which he or she can learn to draw conclusions. Journal entries can also be used to record measurements such as numbers of plants or leaves or daily soil and air temperatures.

### Fine Arts



### Art

Again using a clipboard, the garden can be the site for many art lessons. Try field sketching with notes of plants and animals found in the garden. Use different media to capture the beauty of the garden, both close-up and as landscapes. The garden can also be the inspiration for other art lessons in the classroom.

## Integrating the Garden into Your Curriculum

### **Crafts**

There are endless ideas for garden related crafts. [Click here to link to School Garden References for some suggested books.](#) Also attend workshops, get ideas from craft and garden shops, magazines, the Internet, and other teachers. Dried flowers or gourds can be used in craft projects and sold or given as gifts. Names can be grown on pumpkins. Decorative plant or row markers can be made using ice-cream sticks, tongue depressors, paint sticks, or other available materials.

### **Music**

Learning about plants and animals in the garden can be especially fun for children through singing. Garden themed lyrics have been adapted to many familiar tunes. If a sound system is available, introduce different kinds of music while children are working in the garden. Classical music can become associated with the fun of gardening. “The Flight of the Bumblebee” becomes a real experience and can lead to a science lesson on bees.

### **Plays**

Not only can plays be written in the garden, but they can be performed in the garden if there is an outdoor classroom area for “stage” and audience. Some garden areas have room for more than one class so that classes can perform for each other.

### **Social Studies**



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The garden is a great place to teach social skills and cooperative work, expand horizons, and promote understanding of our world and other people. Students can:

- Enjoy trying new vegetables by picking and eating them right out of the garden.
- Make a salad and have a class party. Invite grandparents, parents, principal, and garden volunteers.
- Study, grow, and prepare ethnic foods for a cultural feast.
- Share family recipes using garden produce.
- Grow Native American crops.
- Explore the contributions of Native American cultures to our agricultural practices and diet.
- Take field trips to local farms, food production companies, restaurants, or markets to show the progression from seed to table.
- Give garden produce to a local charity for the needy.

Group projects create ownership and inspire interest in the garden. They can also become cross-age opportunities using “garden buddies” of younger students mentored by older students. Some projects lend themselves to entire school involvement.

- Hold a contest for garden design, scarecrows, etc.
- Produce a garden newsletter: include poems, stories, and garden articles.
- Mount a photo exhibit charting the progress of the garden project, the participation by students, and the seasonal changes in the garden.
- Produce a video or Power Point Presentation about the garden.
- Teach environmental awareness using the garden as a focal point for litter removal, recycling, conservation and sustainable (earth friendly) garden practices. Relate these practices to air and water pollution, energy conservation, erosion, climate change, and other environmental concerns.
- Check with your principal to see if there is support to start a worm composting project with waste from the school cafeteria. You will need to work with your cafeteria manager to determine how best to sort the waste so that meats, dairy, and bakery products are not included in the waste for worm composting. [Click here to link to the Compost topic for more information.](#)
- Sell dried flowers or produce for a class or school fundraiser.

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### Math



For younger students, use the garden for counting, sorting, comparing, and charting.

- Sprout an avocado seed or sweet potato in water. Then measure and chart the root and top growth.
- Count the number of seeds planted and the number that sprout. Subtract the number that are thinned or die.
- Use the garden to teach beginning measurement.
- Sell produce in a classroom farmer's market to teach money concepts and the use of currency.

For older students:

- Record measurements in the garden using the metric system.
- Chart daily soil and air temperature, then graph, and compute averages.
- Graph and compute average rainfall levels using a rain gauge.
- Make a sundial.
- Measure the length and change in direction of shadows over the course of a day; compare with measurements taken in different seasons.
- Create lessons for division, area, perimeter, fractions, and percentages using the garden.
- Teach economics and business concepts by selling produce or flowers from the garden.
- Teach scale drawing for garden designs.

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### Science



The garden lends itself to many science lessons at all grade levels. Check out the Life Science section for specific grade level Science Standards. The garden is a hands-on laboratory for teaching concepts of classification, plant physiology and reproduction, ecology, plant and animal interaction, animal behavior, weather, and health and nutrition.

Younger students may:

- Germinate bean seeds in plastic baggies or jars.
- Sprout a carrot or pineapple top.
- Dissect flowers to learn about the parts and their functions.
- Discuss daily nutritional needs while grazing on fruits and vegetables.

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Using observational skills, all grades might learn animal behavior from those in the garden:

- Make a toad house and learn about amphibians.
- Make a scarecrow and observe the birds' reactions over time.
- Identify and observe insects. [Click here to link to the IPM form.](#) After research, sort into beneficials and pests.
- Build a praying mantis house and study and record their habits.
- Study local birds and build bird houses or feeders.
- Study worms and build a worm bin: harvest the castings. [Click here to link to the Compost topic of this guide.](#)

Click this link <http://www.csgn.org/curriculum.php> to go to the California School Garden Network Curriculum for more detailed lessons that are tied to the California State Standards.

### **Scientific Method**

Students at all grade levels can use the Scientific Method to perform experiments in the garden laboratory. Review the Investigation and Experimentation Standards in Science to meet specific expectations for the grade level.

A brief version of the Scientific Method for different age groups is presented below:

### **Preschool Scientific Method**

- Guess “what if” you changed something plants need.
- Test your idea.
- Share what happened by telling about your experiment or drawing a picture.

### **Primary Scientific Method**

- Observe in the garden
- Ask a question, “What if...”
- Make a guess as to what will happen.
- Test your idea, changing only one thing.
- Record data in a journal.
- Report your findings.

### **Intermediate, Middle and High School Scientific Method**

- Observe and/or research in the library
- Form a hypothesis
- Design an experiment to test your hypothesis
- List materials needed
- Give steps for method, testing only one variable at a time and using controls
- Record the data
- Show the data on a graph
- Analyze the data
- Draw conclusions
- Make comparisons with other similar experiments
- Accept or reject your hypothesis
- Suggest a new hypothesis

### **Some Ideas to Experiment With in the Garden**

- Record growth rates of plants receiving different watering frequencies or amounts.
- Test the effects of using mulch vs. no mulch.
- Observe for changes in the growth rate of plants in response to varying sun exposures.
- Compare the benefits, growth rate, or vigor of plants started from seed vs. those planted from transplants.
- Record plant growth rate and vigor using no fertilizer versus different chemical and organic fertilizers.
- Compare plant responses to varying strengths of fertilizer or time of application.
- Grow plants in different mediums such as soil, sand, water, different potting soils, etc.
- Test organic pest controls identifying and counting insects, etc. before and after use.



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- Test the vigor of plants by removing weeds vs. leaving weeds among the test plants.
- Change the environment in a creative, experimental way such as growing half the plants upside down.
- Treat seeds differently prior to planting to see which germinate fastest.
- Determine which plants can be grown hydroponically.
- Use the garden to conduct erosion tests, measure run-off, determine best watering method, etc.

Results from experiments are more reliable if sample size is increased by using multiple seeds or plants for the control and each variable tested and if several test trials are run. The averages and range of results can then be compared and analyzed. Results may be shared as Science Fair exhibits, written science reports, or oral presentations. While experiments are being run, interest in the garden and science can be promoted by setting up signs to share the purpose and design of the experiment with others.

The activities provided in this chapter barely scratch the surface of possible ways the garden can be incorporated into school curriculums. Through research and imagination teachers and students are encouraged to develop new ways to learn to share with others the joy of gardening. Click this link <http://www.csgn.org/curriculum.php> to go to the California School Garden Network Curriculum for more detailed lessons that are tied to the California State Standards.