

# **A Gardening Angels How-To Manual**

Easy Steps to Building A Sustainable  
School Garden Program

*Developed by*

Common Ground Garden Program  
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## **How to use this Manual**

If you don't like reading instructions, skip to the "Getting Started -- Quick Steps" section. It is only two pages and has the most essential information. If you like more detail, we've included more information in the "Getting Started – Detail" section. Additional information can be found in our book, "Children's Gardens, A Field Guide for Teachers, Parents and Volunteers".

## **Introduction: Why Build a School Garden?**

In many urban areas children are surrounded by cement, brick and asphalt. The natural environment is behind fences and not available for hands-on exploration. This often means that urban children do not have a clear understanding of their agricultural heritage. A school garden program can bring nature and agriculture to life on campus. Children become excited about science, math and nutrition through gardening experiences. Creative skills and physical fitness can also be developed through gardening. Because we've seen how a school garden can be a powerful learning tool, we want to share how we've established school gardens in Los Angeles County.

A recent survey by the California Foundation for Agriculture in the Classroom found that more than 60% of the children thought that cotton comes from sheep and that vegetables come from the store. There is clearly a need for agriculture education for urban students. In addition, gardens create enthusiasm for learning, encourage nutrition and foster team building.

A school garden gives young people an opportunity to better understand their relationship with nature, creates a dynamic environment for learning core subjects and promotes cooperation through group activities. Children can be taught to conserve natural resources and preserve the environment. A garden often encourages self-confidence and a sense of responsibility and belonging to one's community.

A garden can also bring a community together. Senior citizens, parents, students and community members can work together on designing, building and maintaining the garden as well as teaching the students after the garden is built. By getting help from many hands the gardening experience becomes enjoyable for all. Document all the steps in building your garden and share it with your students and the community upon completion.

## **The Gardening Angels Program**

In 1990, Rachel Mabie, after visiting too many schools with asphalt play yards and little or no green spaces, had a vision to reconnect school children with their natural environment. At the time she was Youth Gardening Coordinator for the Los Angeles office of University of California Cooperative Extension. She initiated the Gardening Angels School Garden Program. Her hope was that all students – but especially inner city and urban youth – would more completely experience their world through the joys of gardening.

Working closely with teachers Ms. Mabie integrated activities that enhanced curriculum. It soon became clear that to build a sustainable program, teachers would need to have the support of volunteers to assist with the initial development and ongoing maintenance of a garden. Thus the Gardening Angels Volunteer Program was developed. Volunteers worked with schools to install gardens and to teach students gardening skills.

Since that time, scores of schools have been assisted by hundreds of trained volunteers. Some volunteers come to the program with experience in landscaping, farming or construction. Others bring enthusiasm and an interest in learning about nature. The program includes volunteers who contribute professional skills on a one-time basis and others who have stayed involved for years.

In 1997, State Superintendent of California Schools Delaine Easton set a goal to have "A Garden in Every School" by the year 2000. We haven't met this goal, but every year more gardens are being built on school grounds. Since there is a commitment to building school gardens at both local and state levels, there are more funds available to help you in your efforts. Contact the Gardening Angels Coordinator at (323) 838-4543 to get more information about when to apply for grant money and what grants are available to your school.

***The exciting news is that gardens are making a big comeback!***

## Getting Started – The Short Version

You don't need much to grow a garden. Desire is the most important component. Just remember that any new skill takes time to learn and includes making mistakes along the way. Most "green-thumb" gardeners have killed more plants than many "brown thumb" gardeners have tried to grow. The difference is that the "green-thumb" folks keep trying until they learn *how* a plant likes to be grown. Gardening is a skill everyone can develop. If you're not interested in learning to garden, there are *many* other ways to support a school garden.

1. Desire and commitment. Since this is a school project, it is very important to have the support of the Principal or Vice Principal as well as teachers and parents. (Students should also be involved from the beginning, but you probably won't have difficulty finding kids who like to play in the soil.)
2. Find out who is interested in being involved by sending out a flyer announcing a meeting. Personally announcing the meeting to local groups (PTA, Rotary Club, teachers, churches, senior citizen centers, etc.) is even more effective. You should try to involve members from the following groups:
  - local gardeners
  - teachers
  - parents
  - community members
  - students
3. Decide where to build the garden on campus. The following concerns should help you decide where plants will grow best:
  - **Sun.** A vegetable garden needs 5-8 hours of full (direct) sun every day for plants to be healthy. The sun changes during the seasons but in general, a garden that is on the south or west side of a building will do better for vegetables than one on the north or east side.
  - **Water.** Hoses are heavy and often can't be left in the school yard. You will want to build your garden as close as possible to a spigot or hose bib. Or install one near your garden site.
  - **Drainage.** Most plants will die if they sit in soggy soil. Make sure that the site you choose isn't the lowest place on campus. Watch where water sits longest after it rains and you'll know where you don't want to build your garden. If the low spot is the best place for your garden, you can modify it by bringing in gravel to raise the ground level and using raised beds.
  - **Soil.** You can build a garden on asphalt by using raised beds. If you are going to use soil that is already on campus, it is important to have it tested by a reputable company (contact the Gardening Angels Coordinator for recommendations.) Some vegetables can become unhealthy to eat if they are grown in contaminated soil. Testing will cost about \$35-\$50.

- **Access.** The garden needs to be close enough to classrooms that it can be used regularly. A garden that is out of sight is hard to monitor, maintain and enjoy! However, it is important to note that an unfenced garden requires more community involvement to avoid vandalism and theft that can occur when people feel jealous because they are outside the garden community.
  - **Tool Storage.** Choose a location to store and secure tools that is close to the garden so that transporting tools isn't a chore.
4. The site will often determine if you will build boxes ("raised beds") above the ground or put your garden directly into the ground. Note that it is often safer to build raised beds than to remove asphalt and work with the soil underneath as chemicals from the asphalt can leach into the soil over time.
  5. Find out how many teachers would like to have their classes participate. They don't need to know much about gardening themselves. It will take a small amount of time to coordinate parents and community volunteers to help teach gardening to their students. Contact the Gardening Angels Coordinator for a schedule of available classes and locations.
  6. If possible build a raised bed for each classroom that is participating. If not, you'll need to find a way to divide the space so that everyone can work without disturbing gardens belonging to other classes.
  7. Each class that is going to participate in the garden should help with the design. See the section on design for details on how to involve everyone and integrate the different ideas.
  8. Plan a community workday to build your raised beds and get the soil ready for planting. There are many tasks included in planning a workday. Some of the most important are:
    - Publicity
    - Refreshments and drinking water
    - Tools (shovels, trowels, garbage bags, wheel barrels, rakes, etc.)
    - Supplies
    - Crew Manager
  9. Training of volunteers. Volunteers need to:
    - Be available during the school day for a few hours every week.
    - Speak the language(s) of the students.
    - Be able to attend training sessions or have experience teaching children and gardening.

## **Getting Started -- Details**

The steps listed above and the details that follow will help make your desire to create a school garden a reality. As in all endeavors, the more people you involve, the less you'll have to do personally. The first step is identifying the people who can help. Some volunteers may be experienced gardeners, but they don't need to be. There are plenty of tasks for all kinds of different people from digging in the soil to writing letters to calling local businesses for donations.

Obtain the support and official approval for a garden program from the principal before starting. It helps if you put together a garden plan and illustrations of your garden layout.

Make initial contact with the groundskeeper(s) at your campus and assure them that your garden project will not require any additional work. Ask if they would like to join your committee to address any campus needs or requirements. Many groundskeepers give expert advice or lend a hand, outside of their required duties, when they feel they're part of the process.

Make contact with your school district facilities manager to inform them of your intentions (with pre-approval from your school administrators) and obtain basic information such as what resources might be available. Many districts can provide mulch, soil, rototilling and sometimes heavy equipment. They may also have approved plant lists and nurseries where you can receive a discount on plants.

Assure the district facilities manager that you will be taking full responsibility for the maintenance and upkeep of your garden. Also advise them that you will not be using any pesticides or harmful chemicals in the gardens and would like an understanding from them that no spraying will be conducted in or near the garden.

## **Getting the Team Together**

Begin with a discussion of the garden plan, which includes interested teachers, parents and/or garden committee. If there is no garden in place then decide whether to renovate/create a campus plot or build individual raised beds near the classroom(s). Also decide on other partners you want to sit on your committee. Include people from the business community and any parents in the landscape trades (landscape designer, contractor, plumber, etc.) Plan your next meeting with all your partners so that you can lay out the entire scope of the project including all specifications that must be met for district codes/requirements.

When you've organized volunteers into a committee, compile a list of tasks with the name of the person responsible for ensuring that each step is completed. This list might include:

Publicity = Mr. Jones

Tools = Ms. Smith

Outreach = Ms. Vargas, etc.

## **Choosing A Garden Site**

Here are some of the physical features that you should consider when choosing your garden site.

**Water** is a basic requirement. A well-watered garden has a better chance of producing an abundant harvest. Since dragging long lengths of hose to the garden is no fun, the garden should be as close as possible to a water faucet.

If you need to bring water to the garden site, an irrigation plan should be designed. If you don't have a volunteer who can do this, you can get help from several sources including irrigation stores, library books, local landscape professionals and the school district. Rainbird, one irrigation supply manufacturer, has an informative book, "How To Design an Irrigation System". They will also design an irrigation system for you if you send them your site plan or enter the dimensions on their web site. Get all the codes and requirements from your school district facilities manager before beginning. A volunteer who has experience with plumbing or sprinkler installation may be able to help.

If asphalt needs to be removed to bring water lines to your site, you can contact your local utilities (gas co., water co., public works) and many times they will assist you if you have the rest of your plans worked out. Always use school letterhead, or PTSA/booster club letterhead to assure partners that you are indeed non-profit. Some companies receive federal assistance to provide their services to schools. Be sure to get documentation throughout your project to show to funders and other interested groups.

**Good drainage** is important. Do not locate the garden in a low spot where water will collect.

A minimum of **six hours of direct/full sunlight** is necessary for growing most vegetables. Check your future garden site at different times of the day and in different seasons, if possible, to make sure it is not shaded by nearby trees or buildings.

**Avoid** areas that have been sprayed with **herbicides** (sprays that kill weeds.) Pick a spot that has a good growth of weeds. This is a good sign that plants can grow in this soil.

It is very important that children have **access** to the garden. If there are restricted opportunities to observe and work in the garden, interest will diminish.

Children need plenty of room to use **tools safely**, to walk among the plants, and to sit and talk. Gardens are wonderful environments for group discussions.

### **Raised Beds versus Planting in the Ground**

If there is available soil on campus, and you are short of funds, you can have the soil tested to verify safety. If it is safe, you can use it as your garden site. Be sure to check other factors mentioned above.

Raised beds are a good alternative if you don't have an existing site on campus and can't remove the asphalt or cement in a school yard. These are wooden or plastic structures that hold soil above the surface of the ground. The beds can clearly mark plots for individual classrooms or projects. To grow large vegetable plants like tomatoes or corn, raised beds should be at least 18" deep. For smaller vegetables, a 12" bed is sufficient. Raised beds should not be wider than 3-4' so that children's hands can reach plants from both sides without stepping into the garden.

You will also want to line the bottom of the bed with a weed cloth or other material so that water can drain while the soil is held in. If the bed is made out of wood, a 2 inch layer of pea gravel (3/8" or 5/8") will help protect against rot and help drainage. If your bed is on top of soil, then you only need a 6" or 8" depth, as roots can grow into the ground. Turn the soil and add compost where the raised bed will be placed. Then you can build the raised bed on top and fill it with soil.

Plastic lumber is a good alternative to wood as it lasts longer and water doesn't leach chemicals out of the plastic lumber into the soil. If pressurized wood is used, make sure the manufacturer verifies that it is safe to grow edible plants in soil surrounded by their wood. You want to make sure that watering will not leach any harmful chemicals into the soil for plant roots to absorb.

### **Soil – To Keep or Not to Keep?**

In urban environments, the original top soil has often been removed during building construction. Perhaps you will be lucky enough to find a site for your garden that has been maintained from earlier days when agriculture programs existed in schools. However, it is more likely that you will be rebuilding the soil in your garden.

Soil acts as a support for plants. It also holds nutrients, water, air and helpful organisms (we call these "beneficial microorganisms" because they are so small.) In order to grow the healthiest plants possible, it is important to identify what type of soil you are working with so that you can add the necessary amendments (things like compost that make soil healthy) and fertilizers (vitamins for plants).

Soil has four basic ingredients: decomposed rock, organic matter, air and water. Soil particles range in size from big particles (sand) to finer particles (silt) to very fine particles (clay). The amount of each of these determines the texture of the soil.

Soil also contains many living microscopic and macroscopic plants and animals such as insects, earthworms, fungi, protozoa and bacteria. These living organisms contribute organic matter and nutrients to the soil.

Another property of soil is called the pH factor. Soil pH describes the amount of soil acidity or alkalinity. The acidity/alkalinity level is represented by a number ranging from 0 to 14. Acid soils are less than 7, and alkaline soils are more than 7. Soil at the slightly acid level of 6 to 6.5 is best for plants. You can test soil pH with kits from garden supply stores. Organic compost will always help improve the soil, no matter what the pH level or proportions of sand, silt and clay. However, if your soil is high in salt, stay away from manures.

Soil amendments are organic or inorganic materials used to improve the physical condition of the soil. By adding the proper amendments, you can improve the soil structure, which in turn will improve drainage, aeration and the water and nutrient-holding capacity of the soil. (For more information please refer to our book, "Children's Gardens, A Field Guide for Teachers, Parents and Volunteers". There is an order form in this package.)

The only time you shouldn't work in your garden is when the soil is very wet. When you walk on soil that is really wet, you push all of the air out and the particles become almost like rock. To test the soil after it rains, form a ball of soil in your hand. If the ball crumbles, the soil is dry enough to be worked. If it sticks together, it is too wet.

### **Designing Your Garden**

To design a garden, invite students in each class to participate. Even the youngest children can place cut-out shapes on a piece of paper representing the garden. Give the students as much creative license as possible as this helps build a strong garden community where vandalism is less likely. Students can work as individuals or in teams. Each class should choose a design or elements that they like best and these should be presented at the garden

committee meeting. The final design is a synthesis of all major themes from the different classes. Many ideas may be too outlandish, but a garden is supposed to be fun, so find ways to incorporate as many ideas as possible. A garden in Watts, a section of South-Central Los Angeles, has a windmill that the special education class requested in their design. A local business donated part of the cost of the kit and the class followed the detailed instructions and built it themselves. Other classes had wanted a sculpture and were thrilled to have the windmill as “their” sculpture.

If the garden is planned as a larger site on campus to accommodate multiple classes, then it can be helpful to visit other schools that already have large plots before designing yours for ideas on what works and what doesn't. Contact the Gardening Angels Program for a list of school gardens in your area.

### **Training For Volunteers**

At this point it is helpful to seek support and training for those volunteers/teachers who will be the lead gardeners. The Gardening Angels Program offers training throughout the year at various sites and offers a series of fun, educational lessons on plants, soils and how to garden organically.

The Gardening Angels Program can help schools identify local volunteers to work with teachers in deciding what will be taught to students. Older students can help teach younger students. The school is responsible for advising volunteers of all district policies regarding health and safety. Once the garden program is up and running, the Gardening Angels Program can continue to provide gardening information, seeds and consultation.

The Gardening Angels Program also offers educational materials such as its book “Children’s Gardens, A Field Guide for Teachers, Parents and Volunteers”, simple lesson plans and a library of sample curriculum. Other local resources are available through the school district science centers and non-profit organizations which support urban ecology education and greening projects.

### **Seeking Donations and Grants**

Once your garden design is worked out and is accepted by the principal and school district, then it is time to search for resources and funding.

With approved plans, it is easy to submit your “want list” to businesses that serve your immediate community or submit a grant proposal. Some of the most valuable gifts are donations, such as:

- Free Soil from a nearby cemetery
- Free damaged pavers (stepping stones) and
- Fencing from nearby building supply houses
- Employee labor/materials/expertise on work days
- Damaged bags of amendments, fertilizers from nearby nurseries
- Free tools, tables, chairs, etc.
- Food and water for work days from local grocery stores

### **Building Your Dream Garden**

Your garden committee can help organize a workday when all the funding is in place and materials are ordered. There are many community members who can help make this a positive experience. Often middle and high schools have community service organizations – invite them to help. Contact churches and community centers, business organizations and homeowners associations. Be sure to let the local paper and your government

representatives know about the community project. Make a fun day out of it, have a cook-out and celebrate your efforts. Involve students, staff, parents and the whole community.

### **Once the Garden is Ready . . . the Learning Begins**

The volunteer should work with the teacher to decide how and when lessons will take place. When a plan is ready, the volunteer can explain to the class that they will be coming every week to take students to the garden and do indoor garden projects. The students should hear a brief overview and be encouraged to ask questions.

To create excitement volunteers may start off with an art project like building a scarecrow. Seed packets and catalogs can get students thinking about the kinds of vegetables they want to grow. Sometimes drawing helps students grasp plant structure and which part of each plant is edible.

One of the first tasks of the volunteer is to give a simple demonstration on how to safely use garden tools including cleaning and storage. Students can be taught about amendments and help to mix in some amendments and cultivate the soil.

Choosing and planting seeds involves important lessons. Students can read seed package labels and discuss what grows in warm and cool seasons. They can use a calendar to work backwards so that harvest is before school is over. Students can also research spacing, height and other needs of plants. They can observe the sun to determine which plants will be in the shade and which in the sun. (For more information please refer to our book "Children's Gardens, A Field Guide for Teachers, Parents and Volunteers".)

Seedlings need careful watering until the first true leaves appear. Newly planted seeds should not dry out but also shouldn't be kept soggy so a monitoring system will be required for the first 10-20 days. Once plants are established, drip irrigation or soaker hoses can take over, if desired. Plants need water when the soil is dry about 1" below the surface (usually 2-3 times a week, depending on type of soil, time of year, weather and location.)

Be sure to add some flowers to your vegetable garden for beauty and to attract beneficial (helpful) insects like butterflies and ladybugs.

Let the students use their imagination to develop uses for disposable objects. Labels, signs, art projects, scarecrows, trellises and garden gates can all be made from found or recycled materials to add whimsy and a sense of invention and fun to a garden.

As plants grow, fertilizing and adding mulch become lessons. Students can also learn to identify helpful bugs and how to control harmful insects in an environmentally helpful way. Keeping an ecological balance produces a naturally healthy garden.

Healthy soil and the right amount of water for each plant help eliminate most pest and disease problems. If you do run into a large problem, seek good advice before deciding how to control pests. Your local Master Gardener Program and good nurseries can assist. There are also many wonderful books available.

Releasing beneficial insects into the garden can be a fun project. Praying mantis eggs and ladybugs are available at good nurseries. Watching the life cycle of butterflies and silkworms in the classroom can tie in with the life cycle in the garden.

Composting is an important part of a garden. You can have a bin near the garden or a vermiculture (worm) box in the classroom. The breaking down

or decomposition of materials into rich compost is an exciting learning experience.

Measuring, counting, analyzing costs and receipts at a plant sale are all great hands-on lessons in math. Scientific experiments can be done to study what helps plants grow.

The harvest shows the success of the garden. Plan a harvest party or celebration and invite all those who helped. Prepare foods from various cultures and add lots of seeds and nuts to the salad bar to encourage experimentation.

Children perform better when they have had healthy and nutritious foods to eat. When they are young and have fresh produce available, especially if they have grown it themselves, they will learn to appreciate the flavors. They will always remember the sensation of biting into a freshly picked fruit or vegetable. Nutrition is taught simply by growing and eating your own fruits and vegetables.

Always thank those who have helped support the garden project. Letters, photos, and pictures mean a lot, even more if handed out at a harvest party.

Another great lesson in the garden is to grow food for those less fortunate and/or invite a nearby shelter where children attend, to come and share your harvest. In this way students can learn about the larger community and how they can make it a better place to live.

If you would like more specific information, please check your library or contact our office.

### ***Keep Growing!***

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<sup>i</sup> Taken in part from “Children’s Gardens, a Field Guide for Teachers, Parents and Volunteers”, Third Edition, University of California Cooperative Extension, LA County)