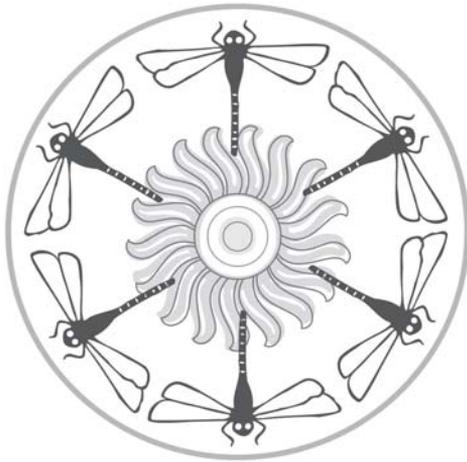


# Cultivating Healthy Communities Through School Gardens



## Planning and Implementing School Gardens and Greenhouses in the Northeast

**Mary Spaulding and Deb Habib**

**Seeds of Solidarity Education Center  
*Cultivating Hope, Educating for Change***



**Cultivating Healthy Communities  
Through School Gardens:  
Planning and Implementing School Gardens  
and Greenhouses in the Northeast**

Deb Habib and Mary Spaulding  
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165 Chestnut Hill Road, Orange MA  
978-544-9023  
[www.seedsofsolidarity.org](http://www.seedsofsolidarity.org)

Funded in Part through a United States Department of Agriculture  
Community Food Projects Grant.  
Special thanks to the Orange Elementary Schools and the Athol Regional Schools for  
their support of school gardens and greenhouses.

Produced and Printed by Union Labor  
Printed on Recycled Paper



# Introduction

Just outside the entrance to the cafeteria, students sit eating their lunch in the early fall sunshine. Ripe tomatoes weight the nearby plants, grown tall from the warmth of the brick wall of the school and the rich compost donated by a local farm. The breeze carries the scent of chives, cilantro, and basil from a nearby garden, each planted in a wedge collectively forming the shape of a pizza. Earlier in the summer, children harvested these tomatoes, herbs, peppers and onions and proudly carried them into the adjacent cafeteria. They were sliced and diced into pizza toppings for a homemade pizza, crust of wheat ground by the children in the school's summer enrichment program. Other vegetables were arranged in baskets at an end of the season farmers market, hand-lettered signs inviting parents, school administrators and community members to transform them into delicious recipes provided by a local teen gardening program.

School gardens connect young people to the source of their food, and encourage healthy eating habits, increasingly important in light of rising rates of childhood and adolescent obesity. School gardens strengthen our local food systems. Food travels an average of 1,500 miles, relying on polluting and diminishing fossil fuels to bring food from farm to table. School gardens enrich school grounds, school lunches and the curriculum. They build teamwork, foster healthy eating habits, physical activity, creative and critical thinking, and joyful connection to our communities and landscapes. Thanks to grassroots efforts, the movement to buy local foods and support local farms is growing in communities all over the world; school gardens are a critical element of this movement.

In the Northeast there is an abundance of crops that can be grown to coincide with the school year and summer programs. Season extension through cold frames and simple greenhouses can make growing food possible from March till December. This guide is designed to inspire and



guide the cultivation of a garden at your school. It can be used by teachers, administrators, food service directors, custodians, parents, PTOs, students— anyone in the school community interested enriching their school and community through a garden or greenhouse. While geared towards schools, community organizations with gardening programs should find it useful as well.

Inside you will find ideas for:

- **Preparing for your Garden**
- **Starting your School Garden**
- **Caring for Your Garden**
- **Special Events and Community Outreach**
- **Integrating your Garden into the Curriculum**

This is not a comprehensive guide to every aspect of gardening, which might feel overwhelming to the novice. Rather, it is a resource with a particular emphasis on school gardens in the Northeast climate, based on twenty years of experience implementing school gardens in various rural and urban settings. Each chapter includes a section called “Dig in and Try This,” that encourages you to actively use this guide as a workbook to help you plan and implement your garden.

Remember that there are many ways to grow a garden. Most important is that whatever you create suits the needs of your site and community, and that you enjoy the abundance and the many ways a school garden can cultivate healthy communities. Many thanks to Mary Spaulding who developed this guide as part of her internship with Seeds of Solidarity Education Center. Thanks also to the Orange Elementary Schools and the Athol Regional Schools for their support of school gardens and greenhouses, and to the USDA Community Food Projects program that promotes food self-reliance in communities throughout the nation.

Deborah L. Habib Ed.D, Director  
Seeds of Solidarity Education Center  
Orange MA, 2004



# Preparing For Your Garden



*Be sure to talk with the custodians and administrators at your school about the garden. Make sure they are interested and know what your plans are well in advance. Though everyone's schedules are busy, you may want to gather a planning meeting of teachers, parents, administrators, students, and your food service director to share ideas and input. Examples of other successful school gardens can be helpful to inspire enthusiasm. The more investment there is on the part of the school community, the better your chances are for success and sustainability.*

## **There are several factors to consider in the initial planning stages:**

### **Sunlight Availability**

Make sure there is a good amount of sun in the spot you choose for your garden.

### **Proximity to School**

It's important to consider the garden's proximity to classrooms. A school courtyard is ideal because it offers a space safe from vandalism, while keeping the garden a part of the school. The garden should be visible from the school so teachers and students have access. If possible, a garden near the cafeteria offers opportunities to draw connections between food and gardens.

### **Garden Size**

A garden does not always have to be in a huge area. A few planters or raised beds in different locations can be great ways to make use of limited space.



## **Dig in and Try this:**

Visualize or tour your school's outdoor spaces with students and other stakeholders such as a PTO member or local farmer. Brainstorm and list several different possible areas where you can plant at garden at your school.



## **Consider your many options as you plan your garden or greenhouse CONTAINED RAISED BEDS**

School gardens work very well with contained raised beds because they help keep the soil enclosed and not spread out all over your schoolyard. Raised beds should be contained with wood or composite lumber. Be sure you do not use pressure treated wood, or wood treated with other chemicals toxic to kids and the environment. White oak and cedar are both good rot-resistant choices for the walls of your raised beds. Composite lumber is made of a blend of recycled plastic and wood chips. Your local lumber yard can tell you what they carry, and best sizes. Be sure to tell whoever you purchase or obtain your materials from that the lumber is going to be used around food plants and soil. Ask your custodian or wood shop teacher if they have any scrap wood that you could use. A high school shop class, local carpenter or skilled parent might be able to help with construction.

If you are creating a container garden on an area with compacted or no soil, or on asphalt, you will want to build containers that are at least 18" deep so you can fill them with good soil and compost. Keep in mind that a season extending row cover can be used over your container raised beds.



## PICKLE BARREL GARDENS

If you are unable to build raised beds, container gardening is a convenient alternative. Container gardens work well in schools with little green space, as they can allow a garden to grow on pavement. They are also great if your school is just learning about gardening and not ready to have a permanent garden. Large, 55 gallon pickle-barrels or other plastic food grade barrels can be cut in half and used. Markets and coops that sell items in bulk sometimes have these, as do businesses that produce foods such as pickles and sauces. Clean five gallon buckets can also work for individual plants such as tomatoes, cucumbers and peppers. Be sure to drill lots of holes ( at least 1/2 inch diameter) in the bottom of the barrels to allow the soil to drain when watered. Remember to locate your barrels where you want them before filling with rich topsoil and compost as they will be heavy!



### Dig in and Try this:

Have students research and brainstorm the pros and cons of recycled containers that might be used as planters. Take your students for a walk around the school grounds and let them help you make a list of possible locations for raised bed or pickle barrel gardens. Be sure to choose garden spots that get ample sunlight!

## GREENHOUSES AND COLDFRAMES

Instead of or in addition to gardens, quality small greenhouses can be purchased and constructed for under \$1,500. A greenhouse heated only by the sun can extend the growing season several months in either direction, often March to November in the Northeast. They can be used to raise seedlings for your garden use, and for students to take home to grow gardens. Seedling sales can promote math and real life learning skills while contributing income to your garden program and encouraging community members to grow vegetables at home. Greenhouses are also really good options if there is only asphalt around the school site.

A 10 by 10 greenhouse is a good starting size. Get one with an entry wide enough for a wheelchair. If you use it for seedlings, you will need some shelves and a potting bench inside. Constructing a greenhouse will likely require some simple power tools. Coldframes constructed of weather resistant wood with non-glass recycled panes are a cheaper option with similar season extension benefits to a greenhouse but these will heat up and cool down more quickly, so you must watch and water them carefully.

There are several catalogues and supplies you can look at to compare the pros and cons of various designs with your students. See The National Gardening Association catalogue ([kidsgardeningstore.com](http://kidsgardeningstore.com)) or Farmtek ([teksupply.com](http://teksupply.com)) for two sources of greenhouses and other supplies.

### **Think ahead about Soil for the Garden or Greenhouse**

When growing vegetables and herbs it is important to use healthy soil. First, find out if the soil you are considering using is contaminated or not. If there is any possibility that the soil is contaminated, contact your local extension agent or board of health to find out how to get the soil tested for lead or heavy metals. As an alternative to using machinery to turn the soil, lay cardboard from broken down boxes covered with straw on top of the grass where you plan to start your garden a year prior to planting. When you and your students remove the cardboard, worms will have chewed through the sod and the soil is ready for planting. This works wonderfully and does not require the use of machinery but the cardboard takes 6-8 months to break down. While the cardboard is decomposing however, you can cut holes in the cardboard and plant large seedlings such as tomatoes, cucumbers or pumpkins; the straw-covered cardboard around the holes serves as mulch. If you are on a shorter time frame you may need to use a roto-tiller to turn your soil if there is topsoil there. If not, plan to acquire enough topsoil and compost, placing this right on the ground to create a foot or so deep of soil in your garden beds.

A local excavation company may have topsoil you can purchase, and they may be willing to donate material or delivery. A combination of compost and topsoil helps to build healthy soil. Contact a local farm to see if they sell compost. Your town or city may have a leaf composting program and may be willing to donate some finished compost for your garden. See Compost suggestions under CARING FOR YOUR GARDEN.



## Dig in and Try this:

Research and compare the pros and cons of various greenhouses using the sources suggested or others. Host a presentation with a local farmer or nursery about suggestions they might have for greenhouse design growing, or have students visit and interview them.

Involve students in calculating soil quantity needs as a great math lesson. List anyone you know who composts and may be willing to donate some finished compost to your school garden:

## Gathering Resources and Supplies for your Garden:

*Your community can offer a wealth of information: local farmers, master gardeners, wood shop classes at local high schools and technical colleges, retired builders, handymen/women, and college students. Have students write letters to solicit donations from different sources for materials and supplies: school parent organizations, lumberyards, nurseries, excavation companies. Seeds companies will often donate new or last year's seeds, just make sure they are viable (germination rates often go down after a year) so your students are not disappointed! Many colleges and universities have service-learning offices and may be able to put you in touch with a college student who is interested in interning or volunteering with your garden program. Some social service agencies such as GED programs, school-work programs may also put you in contact with those looking for volunteer or community service hours who may be able to help you.*





## Dig in and Try this:

Review the following list of suggested supplies for your school garden. Put a \* next to any of the items that you already have, a \$ next to any items that your school would need to fundraise to purchase, and a ? next to any items that you would like to research more about.

Topsoil

Compost

Small 3-clawed hand tools

Shovels

Rakes

Hand trowels

Wood or composite lumber for raised beds

Straw

Seeds

Seedlings

Watering cans

Tomato stakes or cages

Row covers for season extension

Organic seed sowing mix

Small 3-4 inch pots for seedlings (reused if possible)

# Starting Your School Garden



Now that you have gathered the necessary materials you are ready to start your school garden. Seeds catalogues give information about spacing of plants. Take some time to draw out a garden plan on graph paper with location and spacing of plants to help keep things organized when planting. How can you best utilize the space that you have? For example, tomatoes and basil love heat and will grow well against brick walls that absorb heat from the sun. Walls can also be used for climbing plants such as peas and beans. A shadier area might be perfect for spinach or lettuce. Put your plan in a plastic sleeve to protect it while passed around in the garden.



## Dig in and Try this:

Conduct a survey with your students. Ask them what types of vegetables they like to eat. Students can also take home a short survey and ask their friends and families what types they prefer to help you decide what to plant. Do look through seed catalogues, and stretch yourselves to try vegetables and varieties that might be new to the students. For example, you might get green bush beans, and some purple and yellow ones too. What are some vegetables and herbs that reflect the cultural diets of your community? What are some that you can try to learn of the foods grown and eaten by diverse cultures?

Create a chart such as the one below with a list of the types of plants you plan to grow and estimate a number for each plant, as well as when the plant or seed can go in the ground ( see below). If you are new to gardening, ask an experienced gardener in your community if they can come in and help with this step, and share their knowledge.

<b>Type of Vegetable/Herb</b>	<b>Number of Plants</b>	<b>When to plant</b>

## SEEDS AND SEEDLINGS

*Some plants are best started prior to planting outside and others do better seeded directly into the soil. You can extend your student's gardening experiences by starting seedlings during the late winter or early spring. Placed on a sunny windowsill or under a grow-lamp, students can watch and care for seeds that sprout into seedlings. This is a great opportunity to integrate lessons about plant growth into your curriculum. In the late spring/early summer students can proudly plant the seedlings they have watched grow in their classroom out in the garden.*

Seedlings can be started in a variety of different containers. Clean and empty milk cartons or yogurt cups work well with a few holes punched in the bottom.

Restaurants and fish markets often have sturdy plastic trays, about 12" x 20" and 3"- 4" deep in which fish is delivered. Make holes in the bottom and sow seeds in these, keeping warm on a windowsill or in your greenhouse prior to transplanting into other containers or directly into your garden. These can also be used as mini garden beds as you can sow Asian greens or lettuce mixes directly into them, and harvest 3 weeks later by snipping with a scissors for "baby greens." Water, and they should come up again for another harvest. This is known as "cut and come again" greens.

**The following can be planted outside prior to the end of May, as soon as the ground can be worked:**

- Seeds: *Carrots, Peas, Spinach, Beets, Radishes, Asian Greens mixes, mesclun ( lettuce mixes), scallions*
- Seedlings: *Lettuce, Chard, Kale, Collards, Broccoli, onions, leeks, parsley*
- Other: *Potatoes, onion sets, garlic cloves (will make greens only when spring planted)*

**The following can be planted outside at the end of May:**

- Tomato seedlings  
Pepper seedlings  
Eggplant seedlings  
Summer or winter squash seeds or seedlings  
Pumpkin, melon, and cucumber seeds or seedlings  
Basil seedlings  
Bush or Pole bean seeds

## **The following can be planted outside in early September:**

Seedlings (kale, chard, lettuce, Asian greens)- All will be ready by end of October- keep row covers over them and keep harvesting until Thanksgiving.

Garlic can be planted in early October for harvest in July

Remember, if you have a **greenhouse** you can extend your season, and the planting dates above earlier in the spring and later in the fall. Simple fabric or plastic row covers, available at garden and farm supply stores, also enable you to extend the season.

## **Cold Frames**

Can be used to start seedlings, or protect those sensitive to cold during the early spring and late fall months. You can order these from [kidsgardeningstore.com](http://kidsgardeningstore.com) or [teksupply.com](http://teksupply.com). Garden supply and hardware stores often have simple directions for building them. You can also simply construct cold frames by building haybale walls and placing an old window- be sure it is non-breakable plastic rather than glass for safety purposes- on top. A nursery may have some scraps of rigid transparent plastic to give, or you can construct windows of heavy plastic framed by wood. You must be sure to raise and lower the "glass" to vent your coldframe during the day as plants can easily "cook" within your coldframe when the sun is out.

## **Compost**

Composting is a fun and an easy way to build your soil for your school gardens. A pre-made compost bin can be purchased at a local hardware store, or possibly with your town or city's waste management program. Students can save their fruit and vegetable scraps from their lunches and contribute to the pile. Turning the pile is important, as is layering it with straw, leaves and food scraps. Compost piles will create rich soil, but they will be more efficient the more they are turned and cared for. Students learning about decomposition and cycles in school will enjoy watching waste turn into soil.

## **Vermicomposting/ Worm Bins**

Worm bins are an easy way to compost student's food scraps indoors. Kids love to watch worms transform their apple cores into rich soil that they can use in their garden. A worm bin can be made in a Rubbermaid tub and kept in the classroom. Worm castings (manure) can be harvested and sprinkled around the base of garden plants- they are one of the best forms of fertilizer available. See Mary Appelhofs *Worms Eat My Garbage* for more tips and curriculum ideas for using your worm bin in the classroom.

# Caring For Your Garden



*Now that your garden has been planted, it's important to take good care of it, especially when seedlings and seeds are recently planted. Be creative with assigning maintenance tasks to students. Classes can adopt a garden bed or take turns maintaining the school garden. After school and lunchtime programs may also offer a good opportunity for students to participate in garden maintenance. A few minutes spent weeding the school garden is a great way to get some fresh air! The more (ecologically sound) pest and weed management techniques you implement at the onset, the less time you will have to spend maintaining your garden.*

**Mulch** suppresses weed growth and holds in moisture. Mulched plantings will grow better over the summer, although they still need some tending. Use straw with minimal weed seeds as your mulch. Straw placed on top of cardboard keeps moisture in and weeds down even more.

**Companion planting** of flowers such as marigolds near your vegetables helps to deter some animals from eating your plants and add beauty. Flowers and herbs can also attract beneficial insects and pollinators such as bees and butterflies.

**Pests** are less interested in healthy and vital seedlings strengthened by growing in nutrient rich soil, another reason for healthy soil. Avoid pesticides, even those identified as "organic" as they are still toxins and not advised for use with children. Ask your extension agent for ideas or resources for IPM (Integrated Pest Management) and if they can come and offer some advice and perhaps a workshop for your students. Identify, log, and count pests to enhance observation and learning. Hand pick pest insects such as potato and cucumber beetles. Study pests and beneficial insects and experiment with releasing beneficial predatory insects such as ladybugs to control aphids. Remember, a beetle-nibbled bean leaf may still produce ample beans.

**Row Covers** are used to extend the growing season by creating a greenhouse effect for plants that cannot handle cold weather and frosts. They can also aid pest control by keeping them out, especially when plants are young, tender and most susceptible. Ask about floating row covers, often under the trade name of "Remay" at your garden center.

These can be laid loosely over the bed and secured with rocks, sandbags or soil around the edges. Or, the addition of heavy gage wire bent into hoops and inserted into the soil on either side of your garden bed allows the row cover to form a mini-greenhouse over the bed. A local farmer may also be able to donate some smaller used pieces of row covers or plastic.

**Fencing** around your garden helps to discourage larger animals from munching on your vegetables. Fox and coyote urine (ask at a hunting supply store) on cotton balls in film canisters hung around the garden can discourage munching critters.

### **Watering**

Watering cans work well for watering when there are plenty of students to help with the task of filling and sprinkling. Alternately, perforated hoses that drip water directly onto the beds or sprinklers can be used. Students and their families can sign up to take on watering weeks throughout the summer. Again, mulching your garden will significantly reduce watering need and maintain plant health by reducing likelihood of stress from drought. Teachers and custodians in the building may help to water in exchange for vegetables and appreciation.

## **GARDEN CARE IN THE SUMMER MONTHS**

Schools might hesitate to start gardens in the Northeast because they believe the growing season only takes place when students are out of school. Greenhouses and coldframes will extend the season for school-year use.

**There are many creative ways to maintain a garden during the summer while building student and community investment:**

At the end of the school year, solicit school families to **“adopt the garden”** for a week during the summer. They weed and water in exchange for some produce.

**Garden clubs** or a task force established during the school year can organize work volunteers (students, parents and community members) to keep the garden going throughout the summer.



*The garden at White Brook Middle School in Easthampton, Massachusetts is cared for by the Treehouse Summer Gardening Club during the summer months when school is out of session. Members of the club join their garden leader, Hope Guardenier every Tuesday and Thursday afternoon to tend to their garden and take field trips to local farms. After a summer of hard work, members of the club attended the summer NOFA (Northeast Organic Farming Associations) conference in Amherst, MA to sell their produce to other attendees.*

**Summer programs** offered at your school can keep the garden going and evolve an entire program around the garden. Kids can care for the garden and participate in garden-related activities that promote science, nutrition and service learning.

If your school has a **summer feeding program**, there might be a way to have students help maintain and enjoy the garden ( and its bounty) when they come for lunch or breakfast.

Organize a **community work day** with local organizations to come help in the garden during the summer, or any other time of year.

*The Oasis (Orange After School Investigation Series) program in Orange, MA, includes a summer gardening program which is offered free to elementary age students. In the spring, students and teachers planted vegetable gardens at two schools with the help of teens from Seeds of Solidarity's SOL Garden, which coincided with National Hunger Awareness Day. One of the gardens was shaped like a pizza and planted with "topping" crops. Throughout the summer, the students gathered every Friday morning where they enjoyed weeding and participating in garden-related activities led by a community member who is also a farmer. The group ground wheat for crust, and made their own pizzas incorporating garden produce. A small farmers market was held at the school at the end of the summer for parents and friends of the gardeners where all of their produce sold out! In the fall, carrots from the school garden were used by the food service staff to bake carrot bread that was served at a local foods breakfast event that followed Walk Your Child to School Day.*



## Dig in and Try this:

Who do you know who might be interested in helping with your school garden during the summer? What groups or clubs already exist at your school who might like to help? Make a list of possible volunteers and community groups to contact.

# Special Events and Community Outreach



*A school garden creates many opportunities for community involvement. Students find great joy and pride in sharing their harvest and learning with others.*

## **Classroom-friendly recipes**

Students can solicit favorite recipes from their families that use garden produce and herbs. This is also a great way to celebrate cultural diversity through traditional foods and menus. Compile recipes into a booklet that can be distributed to all families. If your school has kitchen facilities the recipes can be prepared and tested by students.

## **Host a community meal with the garden produce**

A community meal is a great way for students to share their harvest with their community. Students can help with planning the menu and helping with food preparation and serving.

Teen Members of Seeds of Solidarity's SOL Garden program served a meal to senior members of their community. The event was planned in advance to be served at a local senior center. Grandparents and other seniors were invited with a homemade invitation. The day of the dinner, SOL Gardeners harvested and prepared fresh dishes from their garden bounty. The meal was a success and the teenage chefs and servers enjoyed getting to know some of the seniors in their community and sharing the food they worked so hard to grow. SOL Garden also created a booklet with recipes including fresh pesto and SOLsa. The recipe booklets have been handed out at local farmers markets and numerous community events.



## **Farmers Market**

If there is a local farmers market in your town or city, students and adult volunteers can take turns selling products from their school garden to local customers, or simply one day during the season. A school can host its own mini-farmers market, collaborating with other students and school gardens to come and sell their produce.

Canvas shopping bags can also be painted by students to sell and promote recycling. Great community outreach plus students learn about farmers markets in the region.

## **Empty Bowls**

This is a creative service learning idea that links nicely with a garden. Groups across the nation have adapted the Empty Bowls concept. Students make functional ceramic bowls with an art teacher or local artist, or non-functional ones made from paper mache. Community members are invited to a soup and bread dinner, with food prepared by students (in conjunction with a local restaurant/chef, or the food service director). Attendees purchase a bowl and enjoy soup and bread, with proceeds donated to a food pantry or other agency as decided by the students.



### **Dig in and Try this:**

Brainstorm an idea for a special event that would link the school and community, promoting awareness of the school gardens as well as service learning. Is there a community agency or organization, such as a local food bank or pantry that you might partner with to create this event?



# Integrating Garden Experience Into the Curriculum

*There are numerous ways to apply your students garden experiences to curriculum frameworks and requirements.*

- Create garden journals for observing changes in the garden; students can use drawing, writing, and photography to record what they see.
- Grow a heritage garden and plant vegetables and herbs that originate from diverse regions of the world. Students can study the history of vegetables and use vegetables and herbs to make traditional foods from these regions and cultures.
- Gym class! Gardening can be considered exercise, why not work with your physical education teacher(s) to implement a garden class ( and stretches for gardeners) into their curriculum?
- Study predator/prey relationships in the garden such as ladybugs and aphids.
- Compose letters to other schools with gardens around the state or nation.
- Measure and lay out garden beds on graph paper when preparing your school garden.



## Dig in and Try this:

Brainstorm a garden related activity or project that links to each of these; Science, Math, Language Arts, Social Studies, Health, Art. Look over your state or grade level curriculum standards and list those that can be addressed through the activity ideas you generated.

*Enjoy the abundance of your school garden or  
greenhouse. May it help to cultivate  
a healthier community in your school and beyond.*