



USDA TOOLKIT

What is a school Garden?

A school garden is an innovative teaching tool that allows students and teachers to have a natural environment to explore multi-disciplinary lessons - from literacy, social studies, art, math and of course science. School gardens vary greatly in terms of size and structure. However school gardens are nothing new! Many early philosophers and educators wrote about the importance of gardens in education, such as John Amos Comenius (1592-1670), one of the earliest supporters of universal education, who wrote, “A school garden should be connected with every school, where children can have the opportunity for leisurely gazing upon trees, flowers, and herbs, and are taught to appreciate them.”

School gardens originated in Europe and made an appearance in the United States in the 1890s. Gardens became increasingly popular during both World War I and II as “victory gardens,” until the 1940s when priorities shifted to a more classroom based model of learning. In recent years school gardens have regained popularity as environmental education plays a more central role in many schools, and educators are seeking non-traditional ways to reach their students.

School gardens may be comprised of many individual plots or take on more of a community garden style with one large plot. School gardens may even be a collection of container gardens or windowsill gardens depending on available space and resources. Regardless of size, a successful school garden will be one that is maintained properly, integrated into the classroom, and supported by staff, students, volunteers and administration.

Why garden with students?

Gardening with students affords opportunities for students to solidify what they have learned in the classroom with hands-on learning. The garden also provides a natural environment for students to ask questions and participate in the scientific method. The garden is a natural environment for studying ecosystems, weather and insects. The garden also can be the context for year-round science experiments - for instance if a child asks about the role of worms in the garden, students can study the effect worms and other decomposers have on the soil through experiments in the classroom. Students are learning while practicing teamwork and cooperation. The benefits of gardening with students are numerous. The more involved students, teachers, parents and the community are in the garden the more valuable it will become. Among the many benefits are:

- Addressing multiple learning styles
- Incorporating interdisciplinary lessons
- Increasing awareness and improving attitudes toward environmental issues
- Promoting good nutrition and exercise
- Teaching patience and responsibility
- Instilling a positive work ethic
- Increasing students sense of empowerment and self-esteem
- Improving classroom and school morale
- Beautification

When using the garden as a context for learning and teaching, the students are able to build their own knowledge through their observations in the garden and learn on their own terms. In a sense, the garden is the teacher, and the student can have direct access to the “material” by constructing their own understanding in their own language, and therefore becoming directly responsible for their learning process.

Educators such as Dewey (1915) and Montessori (1912) recognized the effects of gardening on both the educational and the psycho-social-physical development of children. Maria Montessori writes, “When he (the student) knows that the life of the plants that have been sown depends on his care... the child becomes vigilant, as one who is beginning to feel a mission in life.”

“For us, the garden has been much more than simply planting vegetables and taking care of them. It’s been a bonding experience. When we go to the garden as a class at the end of the day, there is a strong feeling of shared joy and peace no matter how hard the day has been.”

-Fourth, fifth, sixth grade teacher in California, participating in school gardening program.

When you’re inside and you’re learning about plants you say, “Oh, this is this kind of plant.” But if you’re outside and you can feel it, see it, and observe it, you understand more. When I’m outside I can see all the beautiful senses, and when you turn those scenes into education, that actually works for me. You use your senses to detect and feel life.

-Kaitlyn St. James, CA fifth grade student

How to start a school garden?

Starting a school garden is a great way to enhance students learning, enrich the community and improve the environment. However, it is not a task that should be started in haste. When considering starting a school garden consider how the garden will be sustained both now and in the years to come. Plan for how the garden will be maintained during the summer, or incorporated into a new or existing summer program. Determine what costs will be associated with both start-up, ongoing needs and yearly maintenance. It’s also important to identify the resources that are available in your community. Securing in-kind donations and services is a great way to cut costs and encourage involvement in the garden. Seek volunteers from a PTA group, and local civic and charitable organizations. Volunteers can be integral in hands-on work in the garden as well as securing resources, donations from local vendors or writing grants for on-going funding.

- organize a committee/support base

As it has been stated, having the support of the administration, staff, teachers, students, volunteers and parents is integral to a successful school garden. It is ideal to involve a representative from each of these groups in the planning process. Determine and agree upon what the role will be of each group in the sustainability of the garden. Keeping in mind that the sustainability of the school garden and it’s guaranteed success depends on the students participation. Under the “Tips for Success” section you will find suggestions for sustainability, tested and proven by the Global Gardens model of school garden integration.

- select a garden site

Determining the best site depends on the type of garden you plan to implement. However, there are a few general rules for selecting a good outdoor site. A good site is one that is easily accessible, to ensure that the site will be utilized and to maximize opportunities to be in the garden. For most traditional gardens the site should receive 6-7 hours of sunshine, have easy access to water and not be in conflict with underground utilities. In addition there are other resources in this toolkit to help you choose a site that’s right for your garden.

- design your garden

The design of your garden should reflect those who will be using it. The best advice is to start small. Having

initial success with a smaller space will increase your chance for long-term success and sustainability as you expand the garden. Involving those who will be using the garden, i.e. students, staff, volunteers, in the design process will also increase ownership of the space and increase positive attitudes toward the garden. A few key questions to consider when designing your garden include:

- Will there be individual gardens within our space?
- Will we need to include a space for a green house?
- Is there a need to secure the garden with fencing or gates?
- How will we incorporate native plants?
- Will the garden be accessible to those with special needs?
- Where will the compost area and tool shed be located?
- Do we need to incorporate a shade structure?

Tips for Success

- designate a staff person to maintain the garden and facilitate garden education

A successful garden is not indicated by size or amount of produce generated. At Global Gardens we believe success is based on student engagement and ownership in the garden. The Global Gardens model is focused on sustainability and integration into the school culture. In regards to these principles Global Gardens maintains that the best practice is to have one staff member designated to teaching and maintaining the garden.

Having a position for a garden educator provides consistency in integrating the garden into the classroom and ensures that other typical classroom responsibilities don't take precedence over the garden. With a supportive administration the garden educator functions as any other staff member and is given adequate time, attention and resources to carry out the responsibility of the garden. Unlike other "specials" i.e. art, music, P.E., we suggest that in elementary settings the classroom teacher remains with the class during garden time. This helps to maintain a cohesive classroom setting, whether in the classroom or outside in the garden. It is also important so that the classroom teacher is familiar with what his/her students are engaging in during garden time and can use the garden to connect other learning objectives. The garden educator can also provide enrichment ideas using the garden as a prompt for writing, the basis for math problems, cultural studies, life science, character building, etc.

- plan for year-round care of the garden

Global Gardens also recommends that any school garden must plan for the summer to ensure garden care and maintenance. Creating a summer program focused on the garden or incorporating it into an existing summer program emphasizes the importance of the garden as a living organism, which requires commitment. In addition, students involved in the garden during the summer gain the joy of the summer harvest, realizing the bounty of their hard work, thereby increasing positive attitudes toward the garden and increased ownership in the project.

Fall and spring gardens are also an important component of a school garden. Having fall and spring gardens help make students aware of growing seasons. Fall and spring gardens also give ample opportunity for all students to participate in both planting and harvesting, as well as experience the life cycle of a plant. During the winter we suggest continuing garden education indoors to create a continuous connection with the garden. Indoor experiments can be created to explore questions related to the garden. In addition, winter can be used as a time to reflect on the previous growing season, research and plan for spring gardens, and prepare beds by planting cover crops or creating lasagna gardens to enrich the soil.

- start small and remember everything is an experiment

When planning a garden, especially one that will be a place for students to learn and interact with their environment, it's crucial to start small. Small successes will be the catalyst for growth! It's also important to view everything as an experiment. Use the garden as a place to learn rather than to function as a model garden or production garden. Mistakes and unforeseen challenges are opportunities to experiment and learn best practices through hands-on engagement.

What is Global Gardens

Global Gardens is a non-profit organization founded in January 2007 in Tulsa, Oklahoma as a response to the issue of inequitable education. Global Gardens currently serves 1,100 students pre-k-7th grade at two sites with over 65 hours of instruction per week. Global Gardens is guided by the belief that students are empowered when given the opportunity to ask questions, and are provided with the tools to find solutions through experimentation and hands-on experience.

We are deeply committed to those students who are most vulnerable, which guides our mission of working with low-income (Title I) schools. Our programs are academically based and are the result of Executive Director, Heather Oakley's experience gaining her masters in both urban-science and peace education from Columbia University. Our curriculum is a dynamic collection of lessons based on topics from the garden, and students' questions and interests.

Global Gardens is a during school and after school program where students work together to create a community garden on school grounds. During the school day, each class works together to create a class garden with a specific theme. The program provides science enrichment as well as literacy, math and cultural studies that support the Oklahoma State Standards for Education. The school staff and administration have recognized that Global Gardens during school programming is supporting academics and enriching student's school-wide across the disciplines.

The free after school program meets daily throughout the school year and during the summer. This extension offers each student the opportunity to earn their own garden where they are able to plant and experiment according to their own interests. We also plan community days for students and their families to come to the garden during the weekend to work and enjoy being together.

Global Gardens provides students the opportunity to grow their own fruits and vegetables from the school garden, while at the same time, engaging students to become involved in classroom learning and their community. This experience provides many benefits, including teaching nutrition, increasing students' curiosity and motivation, and providing an engaging activity that encourages students in their literacy skills in order to document and communicate the changes in the garden.

Global Gardens also provides a place where students can work, exchange ideas, and pursue scientific questions, as well as provide a place where the neighborhood community can come together, work cooperatively with one another, and share the fruits of their labor. Our programs give the communities where we work the opportunity to create something, and to see the physical changes that come from working to change and improve their community, thus empowering individuals to become agents of change in their own lives.

"We do the garden to unite people. It gives the word community more meaning."

-Tiger, Global Gardener at Rosa Parks Elementary

I love nature and realize the therapeutic value of being outside and nurture a garden and children. I have had students experience personal breakthroughs. The classroom is so structured that it doesn't lend itself to children sharing personal thought, concerns or experiences. When we go to the garden, I have had students hang back to talk about situations that they need help, guidance to deal with successfully. This helps the students regain a good self image and feel better about themselves and others! The class is always excited about Global Gardens time and so am I!

- Ms. Smith, fourth grade, Rosa Parks Elementary

*"If our garden can be a peaceful place then our school can be peaceful,
then our community can be peaceful ... and that peace will spread to the whole world."*

-Nicole, Global Gardener at Eugene Field Elementary



initial garden design prior to meeting with your administrator or supervisor.

Relationship with school or organization (i.e. teacher, parent, community member):

Phone Number: _____

Relationship with school or organization (i.e. teacher, parent, community member):

Phone Number: _____

<input type="checkbox"/> Outdoor	<input type="checkbox"/> Raised Beds	<input type="checkbox"/> Vegetable
<input type="checkbox"/> Indoor	<input type="checkbox"/> Greenhouse	<input type="checkbox"/> Fruit
<input type="checkbox"/> Classroom laboratory	<input type="checkbox"/> Containers	<input type="checkbox"/> Flower
<input type="checkbox"/> Edible / Kitchen Garden	<input type="checkbox"/> Rooftop	<input type="checkbox"/> Herb
<input type="checkbox"/> Pollinator Garden	<input type="checkbox"/> Butterfly Garden	<input type="checkbox"/> Native Plant
<input type="checkbox"/> Special Needs Garden	<input type="checkbox"/> Community Garden	<input type="checkbox"/> Tree
<input type="checkbox"/> Reading Garden (i.e. in community plot)	<input type="checkbox"/> Pond Garden	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Other: _____

☐ Curriculum development
☐ Health and nutrition resource
☐ Hands-on educational resources
☐ School/site beautification

☐ Sanctuary space/reading area
☐ Community gathering place
☐ Service Learning Project
 (i.e. connecting with local food banks to donate fresh produce)

☐ Connecting youth with nature
☐ Greening/environmental action
☐ Other: _____
☐ Other: _____

[illegible]

4. How would you like the garden to integrate into curriculum/activities?

5. Where do you plan to locate the garden?

6. How will donations be obtained and money be raised for the project? What reasources are already

7. What is the estimated cost of your garden project?

Use the Garden Budget Calculator. \$ _____

[illegible]

8. Who are you planning to enlist for your summer sustainability team? (Check off all that apply).

- | | |
|---|---|
| <input type="checkbox"/> Family volunteers | <input type="checkbox"/> Master Gardener volunteers |
| <input type="checkbox"/> Student interns | <input type="checkbox"/> Junior Master Gardener volunteers |
| <input type="checkbox"/> Boys/Girls Scouts | <input type="checkbox"/> Garden Club members |
| <input type="checkbox"/> Boys/Girls Clubs | <input type="checkbox"/> Community members (i.e. seniors or retired citizens) |
| <input type="checkbox"/> 4-H Clubs | <input type="checkbox"/> College students |
| <input type="checkbox"/> High School students | <input type="checkbox"/> Partners in local food bank organizations |
| (in exchange for community service hours) | <input type="checkbox"/> Staff members |

9. What is the tentative garden design?

10. What's next?

Once approval is granted, meet with key stakeholders, such as the head custodian, PTO president, and parent-teacher liaison to share plans and discuss ideas. Spread the word and form a leadership team to share management responsibilities. From there, continue to refer to the Green Thumb Challenge website for step-by-step instructions and resources on starting, maintaining and sustaining your school or youth garden!



Outdoor/Indoor Garden Requirement Checklist

Outdoor Requirements

Sun



Most plants in outdoor gardens require 6-8 hours of sunlight a day. If your location has limited sunlight and you would like to plant outside, use GEF's suggestions for growing shade tolerant plants.

Water



Locate a faucet for hose hookups and/or an easily accessible indoor water source.

Avoid planting in areas prone to run-off (i.e. the lowest elevation in relation to the larger plot).

Soil



Take your kids outside to explore and identify the types of soil in your garden! Use the Types of Soil chart to aid your investigation.

Perform a soil test to determine the pH levels in your soil.

Purchase soil for raised beds and container gardening. Contact a local garden store to purchase it either in bulk or in bags.

Any potential garden plot that is located in an urban area or adjacent to an old building should be tested for lead. Contact your local county extension office for details.

Accessibility



Make sure that your location is accessible during the entire growing season (spring, summer, and fall).

Locate a spot for a compost bin that is both easily accessible and free from heavy foot traffic.

Indoor Requirements

Sunny, south facing windows are best. In shaded classrooms, or in the winter months, artificial grow lights can also be used.

Indirect light can be sufficient for some plants grown indoors. Use GEF's suggestions for growing shade tolerant plants.

Locate the closest available water source.

While container plants dry out more quickly than plants rooted in the ground, be careful not to water too much - it can lead to root rot. Use containers and potting soil with good drainage, and as a general rule, only water the plants when the soil is dry.

Use well-balanced, lightweight soil for your pots and containers. Buy bagged potting soil at your garden store. For an added boost, mix with fresh compost (2: 1). Compost can also be purchased in bags at the store.




To make your own potting soil, try the following standard recipe:

1 part soil, 1 part peat moss, 1 part perlite or vermiculite

Soil can be dug up from outdoors, or you can buy bagged potting soil. Buy peat moss, perlite, and vermiculite at your garden store as well.

Provide your classroom garden containers with good air circulation, as well as a secure area where they won't easily be knocked over or damaged.

Types of Soil

Soil Type	Looks 	Feels 	In your garden 
<i>Sandy Soil</i>	<ul style="list-style-type: none"> • Large, coarse particles 	<ul style="list-style-type: none"> • Gritty • Dry • Falls apart/ crumbles easily in your fingers 	<ul style="list-style-type: none"> • Well aerated, but cannot hold water or nutrients easily. <i>Add compost for nutrients and improved drainage qualities.</i>
<i>Clay Soil</i>	<ul style="list-style-type: none"> • Fine particles • Leaves smudge on fingers • Sometimes reddish color 	<ul style="list-style-type: none"> • Smooth • Sticky when wet/hard when dry • Forms a ball shape in your fingers 	<ul style="list-style-type: none"> • Retains water and nutrients, but severely limits air flow. Hard to dig. <i>Add a lot of compost and some sand. This will help with granulation.</i>
<i>Loam Soil</i>	<ul style="list-style-type: none"> • Balanced particle sizes • Dark brown color 	<ul style="list-style-type: none"> • Some grit/some smoothness • Forms a ball that will crumble when pressed between fingers 	<ul style="list-style-type: none"> • Ideal balance of sand, clay, and decomposed organic matter shares benefits of other two soils. Best suited for gardening!



Vegetable Planting Chart



Crop	Planting Depth	Plant Spacing	Row Spacing	Days to Germinate	Seed or Transplant?
<u>Beans (Bush)</u>	1-2 in.	2-4 in.	18-24 in.	6-10	S
<u>Beans (Pole)</u>	1-2 in.	6-8 in.	18-24 in.	6-10	S
<u>Beets</u>	1 ½ -1 in.	1-3 in.	12-24 in.	7-15	S
<u>Broccoli</u>	¼ in.	14-20 in.	24-36 in.	7-10	S or T
<u>Cabbage</u>	¼ in.	12-24 in.	24-36 in.	7-10	S or T
<u>Carrots</u>	¼ - ½ in.	1-3 in.	18-36 in.	14-21	S or T
<u>Cauliflower</u>	¼ in.	18-24 in.	24-36 in.	7-10	S or T
<u>Celery</u>	1/8 - ¼ in.	6-9 in.	18-24 in.	20-30	S
<u>Corn</u>	1-2 in.	8-10 in.	24-36 in.	7-10	S
<u>Cucumbers</u>	½ in.	6-12 in.	36-60 in.	7-10	S or T
<u>Eggplant</u>	¼ - ½ in.	18-24 in.	24-36 in.	7-12	T
<u>Lettuce (Head)</u>	¼ - ½ in.	12-18 in.	18-36 in.	7-10	S or T
<u>Melon</u>	½ in.	24-36 in.	36-72 in.	5-10	T
<u>Onion</u>	¼ - ½ in.	5-6 in.	18-30 in.	10-20	S or T
<u>Peas</u>	1-2 in.	1-3 in.	24-36 in.	7-10	S or T
<u>Peppers</u>	¼ in.	12-24 in.	18-24 in.	14-20	T
<u>Potatoes</u>	3-4 in.	10-12 in.	24-36 in.		S
<u>Pumpkin</u>	1 in.	24-48 in.	48-72 in.	7-12	S or T
<u>Radish</u>	¼ in.	1 in.	12-18 in.	5-7	S
<u>Spinach</u>	½ in.	3-6 in.	12-18 in.	8-10	S
<u>Squash (Winter)</u>	1 in.	18-36 in.	48-72 in.	7-12	S or T
<u>Squash (Summer)</u>	1 in.	12-18 in.	36-48 in.	7-12	S or T
<u>Swiss Chard</u>	½ in.	1-2 in.	12-18 in.	7-15	S
<u>Tomatoes</u>	¼ in.	24-36 in.	36-48 in.	8-10	T
<u>Watermelon</u>	½ in.	9-12 in.	36-72 in.	10-15	T