LSU AgCenter
Research · Extension · Teaching

Steps to Growing a Successful School Garden

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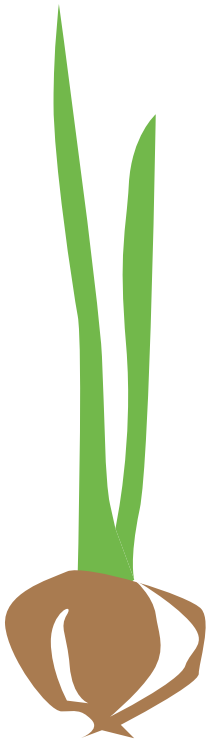


Key Words:

Horticulture – The science and art of growing, cultivating, marketing and processing flowers, fruits, vegetables and ornamental plants

Master Gardener– A person who has had extensive horticulture training from an agricultural extension office

Organic gardening – Using only naturally occurring substances, such as fertilizers or pesticides of animal or vegetable origin, to aid in crop development

Conventional gardening – Gardening that uses synthetic fertilizers, pesticides and herbicides to aid in crop development

Sustainable gardening – A combination of conventional and organic gardening; conventional gardening practices are used as a last resort after organic practices have first been followed

Stolon – A prostrate stem, at or just below the surface of the ground; the stem produces new plants from buds at its tips or nodes

Rhizome – A rootlike, horizontal subsoil stem that produces roots below the ground and sends up shoots from its upper surface

Mulch – A protective covering, usually consisting of organic matter, such as leaves, straw or bark, placed around plants to retain moisture, maintain soil temperature and control weed germination

Tilth – The physical condition of soil in relation to plant growth; soil with good tilth is loose to the touch, has good air space and is not inundated with water

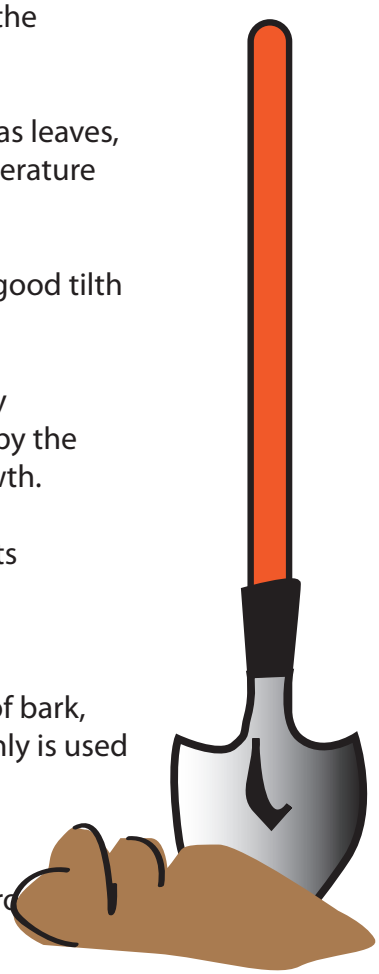
Aeration – Supplying the soil with air; aeration usually is accomplished by removing thatch and pulling plugs of soil from the ground; the holes left by the plugs are then filled with sand; air pockets in the soil encourage root growth.

Pesticide – A chemical substance that kills microbial, fungal or insect pests

Herbicide – A chemical substance used to kill plants, especially weeds

Media – Generally packaged in bags, gardening media is a combination of bark, peat moss, perlite and nutrients; it has no natural soil in it; media commonly is used in the nursery industry

Transplants – Small plants that were previously seeded into seed trays; commercially, these plants usually come in six-packs, although they are gr many ways



Introduction

Growing a school garden can be an exciting, but challenging, initiative.

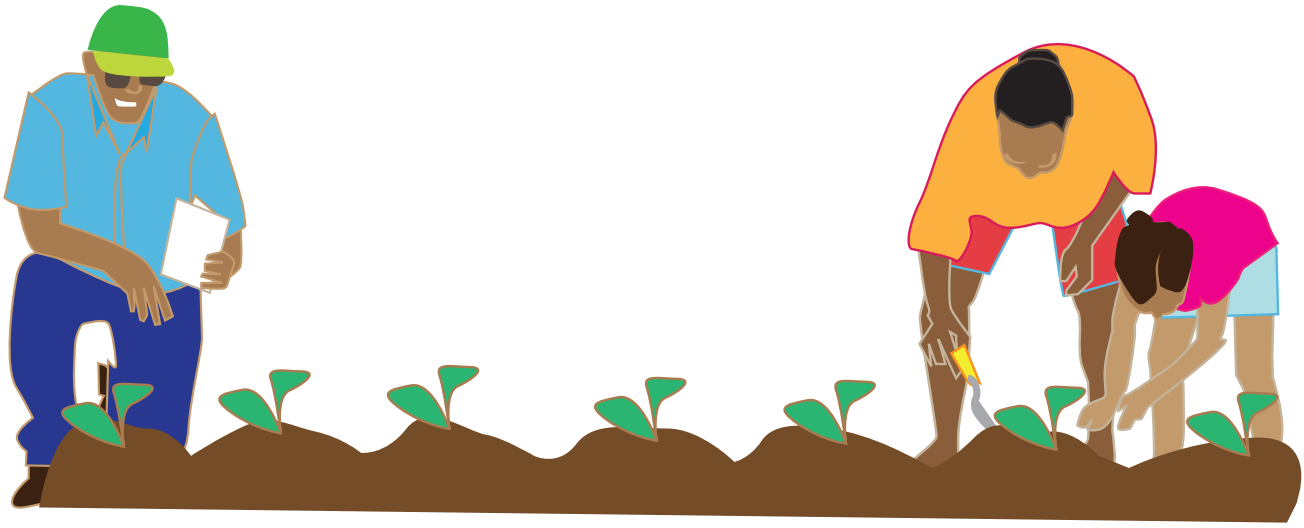
No two school gardens are alike. Your school garden will be unique based upon many things, such as student population, age and needs; garden space available; time constraints; and required coursework. Each teacher also has his or her favorite plants to grow. One school garden may focus on vegetables. Another may focus on native plants or pollinator plants.

The primary goal of a school garden is to allow the students to grow plants from start to finish. There is no greater reward than watching a tiny seed turn into a beautiful flower or something to eat. Well, at least that is true for those of us who are horticulturists!

School gardens have many benefits. The first and most obvious is that the students learn about agriculture. They learn where their food comes from. Students are given responsibilities to care for living organisms. Teamwork, social skills, healthy food alternatives, literature, math, science, technology, social studies, history, art and physical education can all be taught in the garden area.

As an educator, you already have taken the most important steps to growing a school garden. You are showing an interest and encouraging students to become involved. Don't be afraid of failure! Even if you have no horticulture background, you certainly can get the information you need and find people who will help you along the way.

This guide is an outline of the things you should be aware of when starting a school garden. As mentioned previously, every school garden is unique. Use this manual as a guide and allow yourself creative license to grow what you want in the space you have. You may follow all the steps or use information in just a few.



STEP 1: Find a Group of Volunteers

- Parents, school staff members and others from the community are excellent resources for garden volunteers. Everyone has a special talent or a particular interest in life. When selecting volunteers for a school garden, focus on people who enjoy working outside. Volunteers who have construction, horticulture or landscape design experience are great assets. People who enjoy gardening but have no specific training are great, too. Many people like planting a garden. Pick people who will enjoy maintaining the garden.

- Select people who work well with children. The "owners" of the school garden should be the teacher and the students. The students must have an active role in designing, constructing, planting and maintaining the garden.

- Ask cafeteria staff members to get involved with the garden. They can provide kitchen scraps (see list) that can be used in a compost pile next to your garden. They may also take extra produce and incorporate it into the school lunch plan.

- The custodial staff members also are great partners. Custodial staff have access to the water at the school. They will need to know that you are growing a garden so the water supply is not shut off during school breaks and weekends. Some of the custodial staff also may enjoy volunteering to construct and maintain the garden.

- Many cities have a Louisiana Master Gardener Program. Master Gardeners are people who have been trained in various horticulture topics by the LSU AgCenter and its Louisiana Cooperative Extension Service. Master Gardeners complete volunteer services hours each year to maintain their affiliation with the program.To connect with a Master Gardener program, visit the Master Gardener page on the LSU AgCenter website (https://bit.ly/2yW3WNH).

- Collect information from your volunteers. Keeping a record of volunteer phone numbers and preferred volunteer times will help you easily manage your school garden. We have included a sample volunteer information sheet you may use to help with that task. It's located on page 18 at the back of this resource guide.

- Include all volunteers in any garden committee meetings.

- Remember to treat your volunteers as volunteers. These people are only there to help you. They are not paid staff members and should not be expected to do anything outside of what was initially agreed upon. Remember to always thank your volunteers. Allow them to share in the harvest of the garden. Simple thank-you notes from students at the end of the school year also are a nice touch.

STEP 2: Find Funding

- Gardens do not have to be expensive. Some items, such as equipment, can be borrowed. Big expense items would be a tractor or tiller to initially cultivate the garden space. These can be borrowed from parents or local businesses. You do not necessarily need raised beds or fancy pathways to have a functional garden space. Garden items are listed on page 35 of this resource guide. That list will give you an idea of some of the things you can purchase to make the school garden successful. All items do not need to be purchased; some are lofty ideas like greenhouses. Applying for a small grant or receiving a small donation of even $200 can cover the initial expenses for seeds, fertilizers and staking materials.

- Finding a grant can be as easy as using an internet search engine and typing in "grants for school gardens" to locate school garden grants. You will find there are many available.

- Below are tips on writing a grant and being selected:

  Read the directions and follow them carefully. For example, if the guidelines state that the organization will only fund vegetable plants, don't ask for materials to grow a school butterfly garden. As great as your idea may be, it will not be funded if it does not match the wishes of the granting agency.

  Turn the grant application in on time. Late applications are NEVER selected.

  Indicate partners in your garden grant. Granting agencies want to fund something that will be successful. Show that two or three teachers are interested in the project. Report that you have contacted your local extension agent or Master Gardeners to help with the school garden.

  Be thorough. Explain what you wish to do and how it will be accomplished. Just informing the granting agency of your garden idea is not enough; include how you will start and maintain the garden program.

STEP 3: Select a Site

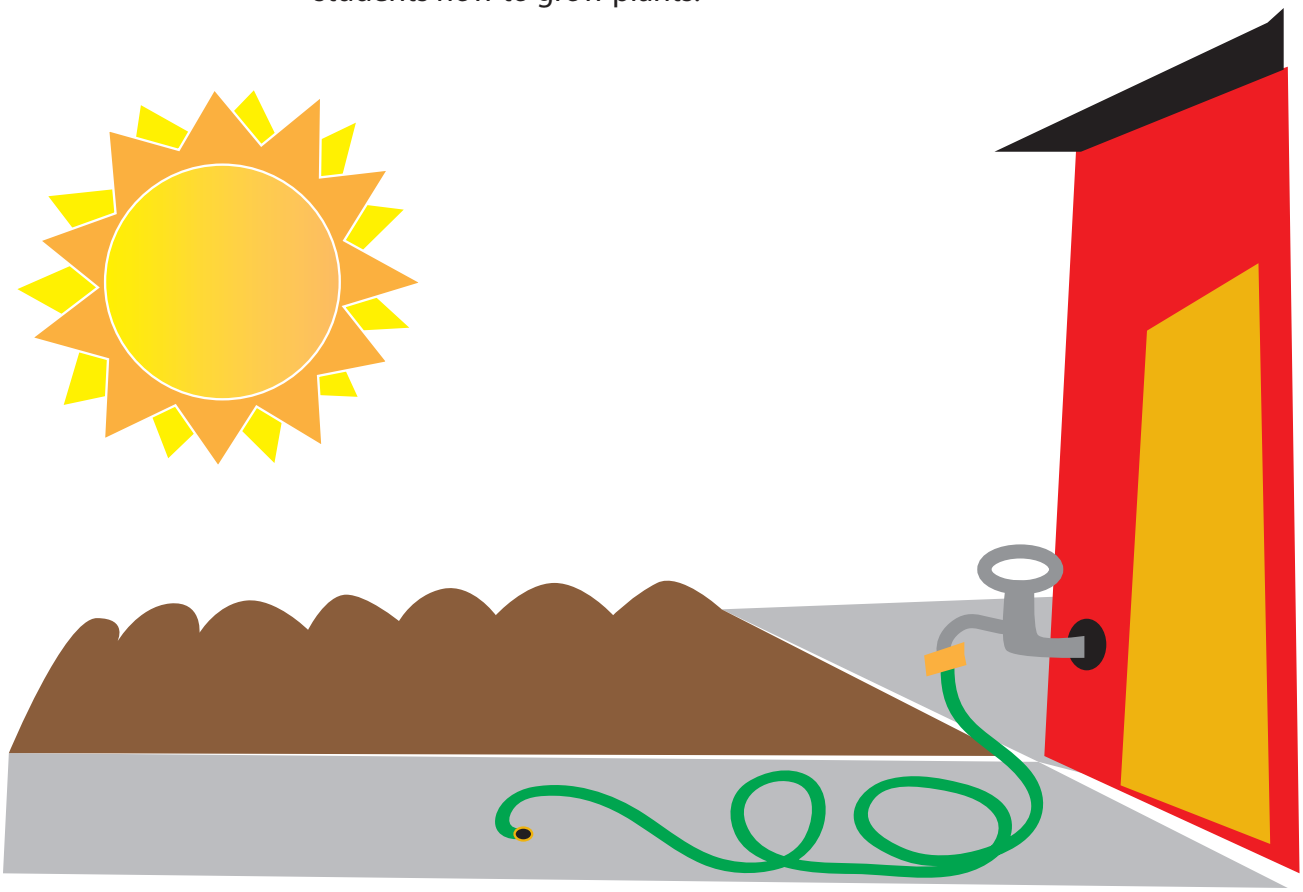
- Choose a sunny location. When growing a vegetable garden, at least six hours of sunlight a day are recommended.

- Choose a location within walking distance from your classroom — the closer the better. More weeds will get pulled — and more plants watered — if you can see them!

- You must have a water source near your garden!

- Choose a well-drained location. Vegetables do not like to be saturated with water.

- Start small but leave space for an enlarging garden. Don't start out so big that you end up overwhelmed. Think about the number of students in your class, the number of volunteers and the time you will spend each week in the garden. Gardening should be fun. You can always increase the size of your garden as you see an increasing interest from the students. Even starting your garden as a few small containers and then moving into an in-ground garden is great if it is a way to slowly teach yourself and your students how to grow plants.



STEP 4: Take a Soil Sample

- Collecting a soil sample is easy. At this point you probably are looking at a patch of grass you would like to turn into a garden.
- First, mark off the boundaries of your garden (1).
- Within the boundaries of your new garden, take four to five shovels of soil (soil samples) (2 and 3).
- Remove grass from the soil samples.
- Put all the soil samples you've collected into one bucket.
- Mix it up (4).
- Take one handful of soil (equivalent to 1 pint) from this bucket and place in a soil sample box or plastic bag (5).
- Print and fill out the soil sample form (6) (https://bit.ly/2Ai5KAX). The mailing information is printed on the soil form. Place a check in the routine sample box, which you can order off www.LSUAgCenter.com or obtain from your parish LSU AgCenter extension office. There is a cost for submitting a soil sample.
- Include pertinent information on the soil sample form, such as what was planted in the location at the time the sample was taken and what you plan to plant in the garden so you can get recommendations for amending your soil. You may say something like, "This area was grass, and we would like to grow vegetables." A general statement is fine.
- The LSU AgCenter soil testing lab will send you general recommendations about how to amend your soil. You probably will want to call your local LSU AgCenter extension agent to help you decipher this information.

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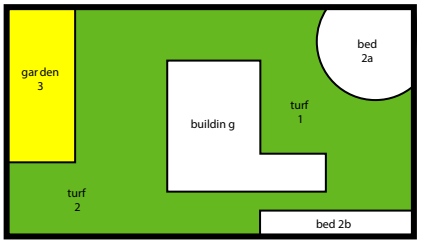

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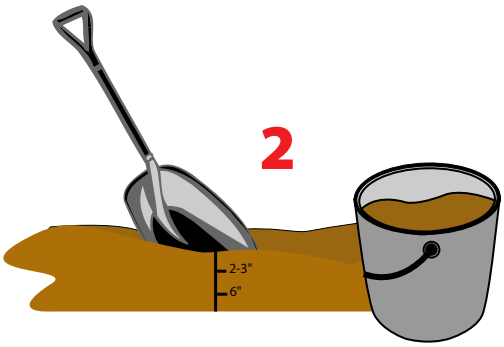

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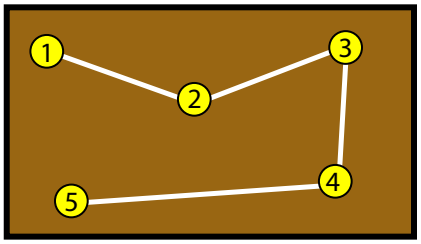

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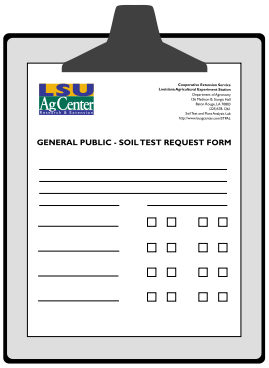


STEP 5: Remove All Grass and Weeds from the Garden Site

Organically

- If you would like to kill the vegetation in an organic manner, place black cloth, wet newspapers or cardboard over the grass. Place weights on top of the cloth or paper so it will not blow away. This will kill the vegetation by stopping photosynthesis by blocking sunlight. Allow a few weeks for the grass to die. Keep in mind this method is slow and not always successful. The weeds will not die anywhere sunlight gets through. You will have to hand till and pull many weeds if you use this method of grass removal.

- You can also simply use a string trimmer and chop down all grass and weeds. Make sure you chop at least 2 to 3 inches into the soil and remove all foliage and roots from the area.

Synthetically

- First talk to your school's integrated pest management coordinator (IPM coordinator). The IPM coordinator MUST approve any herbicide use.

- Purchase herbicides with the active ingredient glyphosate. One of its trademark names is Roundup, but there are other formulations. Spray the glyphosate product within the boundaries of your new garden. Allow two to three weeks for a total "burndown." All the vegetation will be yellow. This particular herbicide is recommended as it is nonselective, meaning it will kill both grasses and broadleaf weeds. Also, it translocates, or moves through the plant, killing both the top and root portions of the plants and weeds. Wait seven days after application to plant any desired plants.

- Please read and follow all directions on the label of any products you use. The LSU AgCenter recommends that the chemical user read the entire label before spraying herbicides or pesticides. Wear gloves, a long-sleeved shirt and safety glasses when spraying herbicides or pesticides.

Remove all vegetation, including dead grass and roots, from the area. Even small pieces of grass stolons or rhizomes can take root. Leaving small clumps of vegetation in the garden area will promote large weed populations in the future. Take the time now to remove the vegetation to reduce weeds in the future.

Till the areas to a depth of at least 8-10 inches using a tractor or tiller. Soil tilth is important to plant growth. The looser the soil, the easier it will be for the plants to root and produce vegetables for the students.

Or, you can build raised beds once weeds and grass are removed.

STEP 6: Order Seeds and Plant Seeds in the Classroom or Greenhouse

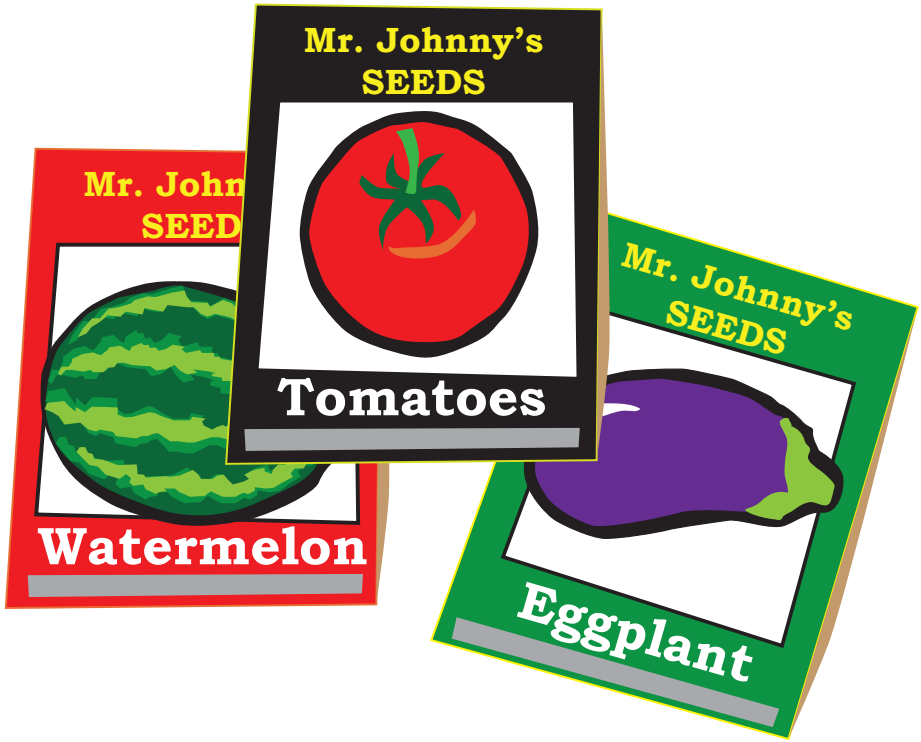
There are three sources that will help you to determine when to plant your vegetables.

1. The first source is a general Louisiana Planting Guide from the LSU AgCenter (https://bit.ly/2Z1yvfO).

2. The second is a book published by the LSU AgCenter titled Louisiana Home Vegetable Gardening, publication number 3000. It can be ordered online for $20 from the LSU AgCenter Online Store (https://bit.ly/2WOJbeS).

3. The third source is the School Garden Planting Guide on page 19 of this publication.

See Starting Seedlings in Your Classroom on page 20 for more information. This sheet includes step-by-step guides to planting and caring for vegetable seeds and a list of companies who sell vegetable seeds directly to the public.



STEP 7: Amend the Soil According to the Soil Lab Recommendations

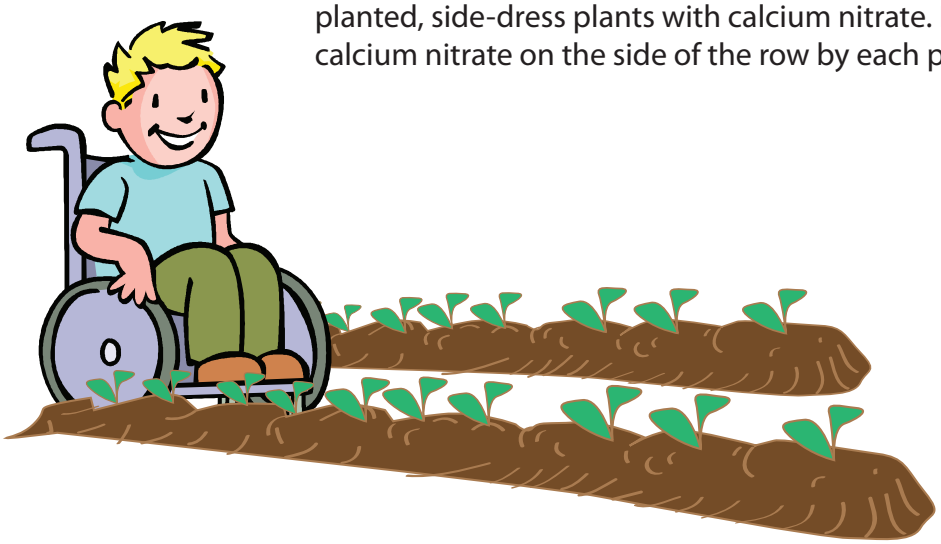
- Ask your local LSU AgCenter extension agent to help you interpret the soil lab's recommendations for amending your soil.

- Ideal soil is loose with a crumbly feeling. It has lots of air space and can retain some water.

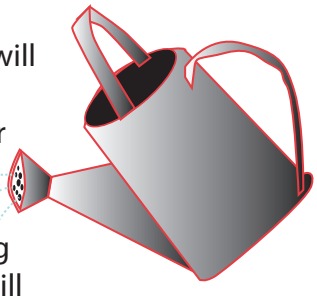
- General guidelines for amending soil are:
  - **Add organic matter.** This helps improve soil structure. Organic matter is anything that was once living. Types of organic matter that are beneficial to the garden include decomposing grass clippings or leaves, disease-free plant materials and compost.
  - **Break up large clumps of soil.** Till the soil to allow for better drainage and air porosity. Large clumps of soil will prevent small seeds from sprouting.
  - **Add a complete slow-release fertilizer like 13-13-13 or 8-24-24.** Incorporate the fertilizer into the soil. Do not just spread it on top. Any fertilizers will work — organic or synthetic — **but PLEASE DO NOT ADD MANURE to the school garden. Yes, it's a wonderful source of nutrients BUT it may also contain human pathogens.**

- Build your rows. Ideal vegetable garden rows in a school garden are 2 feet across the top of the row. There should be 3-4 feet of space between rows to allow students to easily work in the garden once the plants have matured. If you teach disabled students, widen row middles to 5 feet in width to allow wheelchair access. In Louisiana, rows should be approximately 8-12 inches high. This ensures good drainage from the immediate root zone.

- About two weeks after seeds have sprouted and transplants have been planted, side-dress plants with calcium nitrate. Place 1 tablespoon of calcium nitrate on the side of the row by each plant.

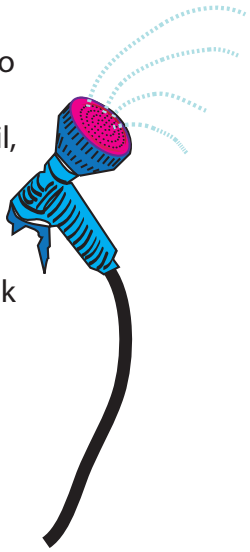


STEP 8: Install Irrigation



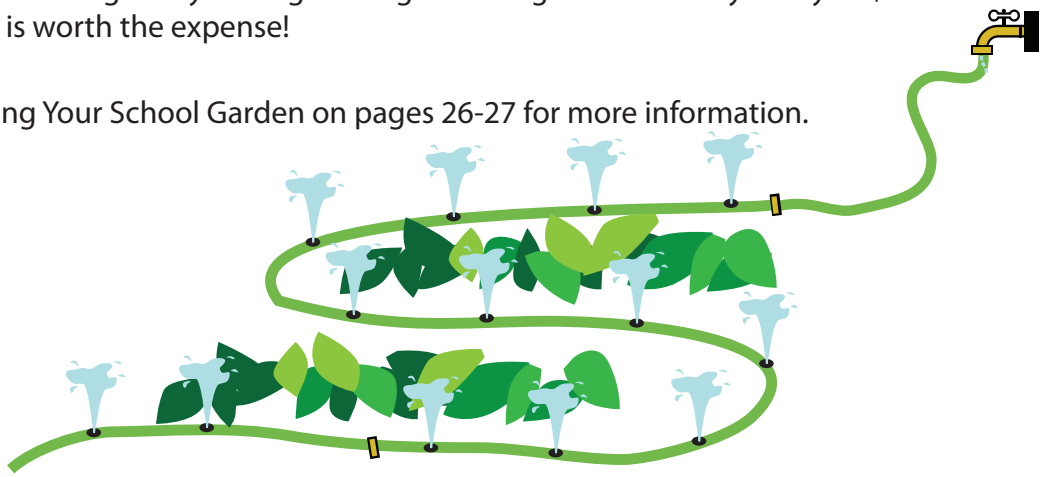
Think about how you are going to water your garden. How large is your garden? Small gardens can be managed by hand watering when school is in session. Who will water when school is out? A simple irrigation system on a timer can provide water when students cannot. There are several irrigation systems that are appropriate for school gardens.

- If the school garden is small and you or a volunteer will water it by hand during the week and on weekends, a simple hose and water wand or watering cans will suffice. If no one will be available to water on weekends and holidays, however, an irrigation system with a timer will need to be purchased. Many irrigation systems are simple, inexpensive and easy to install. For basic systems, you will need a water source near the garden. Local irrigation companies can work with you to customize the design and materials for the school vegetable garden. The most important component is the timer. A good timer may cost $30 to $150, but is worth the expense! For example, a simple irrigation system can involve just a timer attached to drip hoses or to a hose and water wand. Generally, you want to water 15-20 minutes daily when the transplants and seeds are first planted. This time really depends on how much sand or clay is in your soil. The sandier the soil, the less you must water but the more frequent you must make your watering session. Make sure the water softly hits the soil. Be careful so the water doesn't disturb the seeds or wash the soil off them. After the plants are established, the watering can be scaled back to about 30 minutes a day about three times a week — unless there is a lot of rain, which would decrease the need for supplemental watering. A general rule of thumb is that most vegetables need 1 inch of water per week. And remember, plants drink from their roots, so water at the base of plants. There is no need to "shine up" the leaves.



- If you do not plan on being there to water your garden on weekends and holidays, you should consider an irrigation system. Irrigation systems are simple and can be inexpensive and easy to install. For basic systems, you will need a hose outlet near your garden. Irrigation companies can provide you the materials and design for your vegetable garden. A good timer may cost you $30 to $50 but is worth the expense!

- See Watering Your School Garden on pages 26-27 for more information.



STEP 9: Plan for Mulch

- Mulching is the key to successful gardening.
- Several types of mulch can be used.
- Organic mulches such as leaves, compost, pine straw and grass clippings also can be used. Organic materials add nutrients to the soil as they decompose. Place these in between rows and around all plants.
- Other materials like newspapers and cardboard can be placed in walkways and between rows of gardens. Make sure newspapers are shredded and then watered after laying them so they will not fly away.
- Mulch reduces weeds by acting as a barrier to sunlight. Mulch holds heat in the ground during the winter. Mulch decomposes, increasing soil tilth by improving nutrient levels, incorporating beneficial organisms and allowing aeration.
- Black plastic can be laid over row tops. Black plastic prevents weed seeds from germinating because it blocks out sunlight. You must have irrigation under the plastic. Simply poke holes where you want to place the plants.

See Mulch for School Gardens on page 24 for more information.

STEP 10: Plant Transplants

- Allow students to plant their small vegetables. Follow appropriate spacing, especially since we really do not want to have to use pesticides in the garden.

- See the School Garden Planting Guide on page 19 and Starting Seedlings in Your Classroom on page 20 for more information.

STEP 11: Maintenance

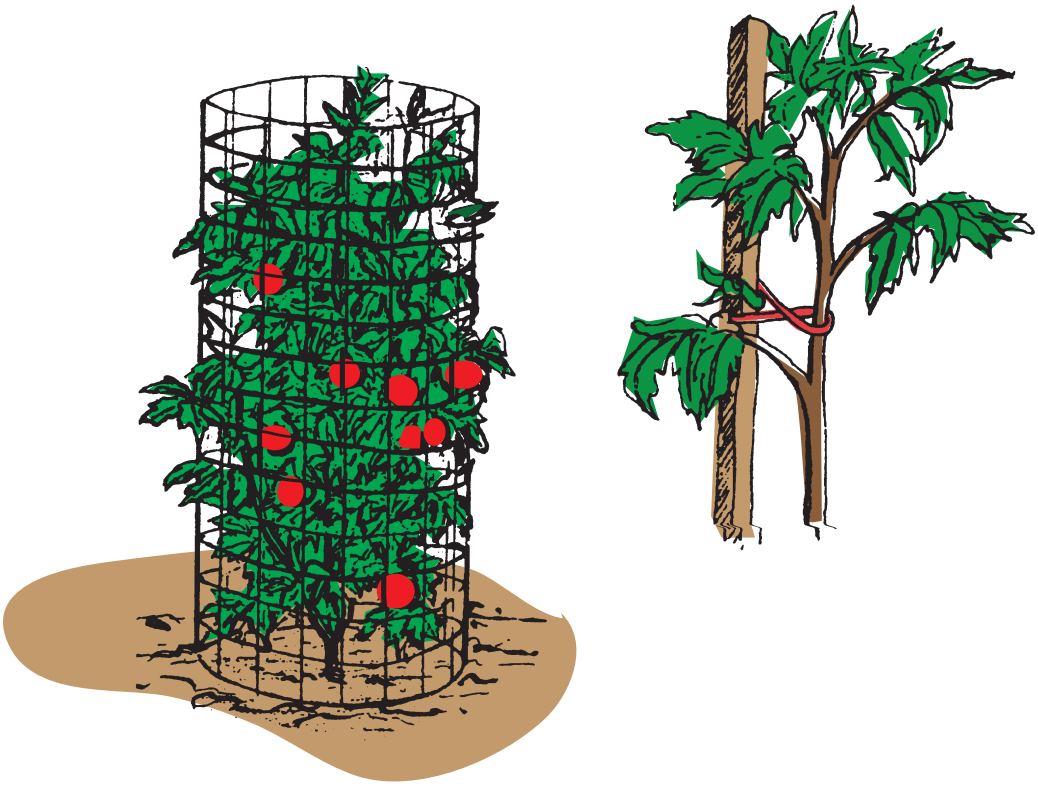
- Now that your garden is set up and your vegetables are in the ground, you can enjoy watching them grow.

- Remember not to let the weeds get ahead of you. Remove weeds when they are small before the problem escalates. Hand weeding and mulching are your best options in a school garden.

- Water your plants frequently but do not drown them. The soil should feel moist but not so wet that the ground is too soft to walk on.

- Continually add fertilizer to your garden for strong, healthy plants. In addition to placing fertilizer in the garden before you plant, you must also side-dress during a vegetable plant's growth. Side-dressing guidelines include:
  - Applying additional fertilizer once flowering plants start to flower (i.e., tomatoes, peppers, cucumbers).
  - Applying additional fertilizer to leafy plants (i.e., cabbage, lettuce, greens, broccoli) two weeks after planting and again two weeks later.

- You may need to stake some of the vegetables in your garden that grow very tall, such as tomatoes, eggplants and cucumbers. The individual crop sheets give general maintenance information.



STEP 12: Harvest

- Students will want to eat what they have grown right there in the garden. Although a school garden is grown generally pesticide-free, always wash the vegetables and ask students to wash their hands prior to harvesting and eating.

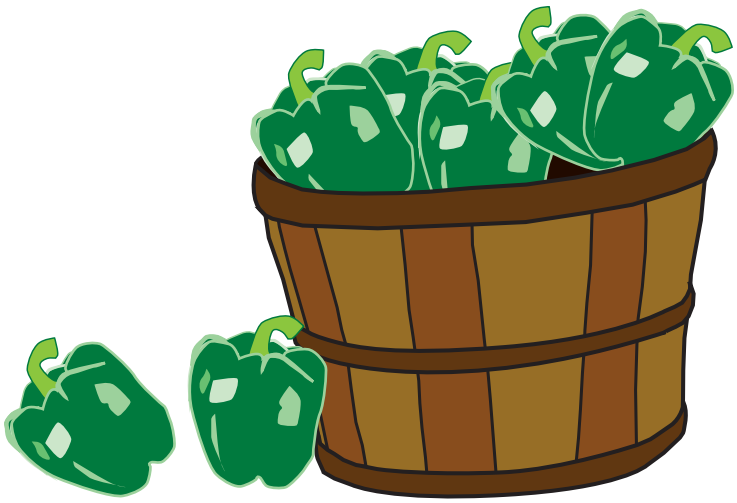
- Before going outside, have a few items to make harvesting easy and fun. Bring clean bags or buckets to harvest the produce into. Bring a pair of pruners for harder-to-pick produce such as peppers, eggplant and okra.

- Remember, this is harvest time, not dig-up-the-garden time! Many plants will keep on producing as the older fruits are removed, the more you pick, the more the plants will produce. Don't let vegetables over-ripen on the plants as the total production will go down.

- After the harvesting is finished but before you go back into the classroom, have students wash all hand tools.

- Once in the classroom, ask students to wash their produce before eating.

- Enjoying the harvest can be as simple as providing the students with a few bowls of ranch dressing to dip their vegetables in. Encourage the students to try a bite of each thing that was grown.



Recommended Cafeteria Kitchen Scraps for a School Compost Bin

1. Egg shells
2. Raw vegetables that do not have any condiments on them
3. Fruit, including the peel, rinds and pulp
4. Paper napkins
5. Popcorn kernels that have not popped
6. Spices
7. Paper towels
8. Potato peelings
9. Coffee grounds
10. Tea grounds
11. Grape stems (all parts)
12. Corn cobs
13. Onion skins
14. Leaves
15. Scrap paper from classrooms

Never add any meat, dairy or milk products to your compost. This will only cause a foul smell and lead to mold growth.

Do not add paper towels or napkins that are coated with milk and other dairy products to the compost bin. Napkins or paper towels may be wet, but if they are dry, it is best to shred them so they do not fly out of the bin and litter the school yard.

Volunteer Information Sheet

Name:
Contact number(s):
Address:
Preferred times to volunteer:
Preferred age group to work with:
Any special gardening interests:
Willing to teach lessons as well as help with garden maintenance? (Yes or No)

School Garden Planting Guide

The crops listed are those the LSU AgCenter recommends for school gardens. The listed crops are planted and harvested within the typical school year (September to May). Other crops may be grown in school gardens, but they are planted or harvested outside of the normal school year. For a complete list of vegetable crops that can be grown in Louisiana, see the Louisiana Planting Guide, Publication 1980 (https://bit.ly/2Z1yvfO).

Key: ***GREEN: Plant seeds in the garden** ****RED: Plant transplants in the garden (Remember to start seeds indoors ahead of time!)**

*****Purple: Plant either seed or transplants into the garden.**

Vegetable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Days to Harvest**
Beans, snap (bush)	*	*	*						*				48-55
Beans, snap (pole)	*	*	*						*				60-66
Beans, lima (bush)			*	*	*								60-67
Beans, lima (pole)			*	*	*								70-90
Beets	*	*								*	*		55-60
Broccoli	**	**	**						**	**			50-90*
Cabbage	**	**	**						**	**			50-75*
Carrots	*	*							*	*			50-75
Cauliflower	**	**	**						**	**			55-65*
Collard greens	*	*	*						*	*			45-75
Cucumbers			***	***					***				50-65
Eggplant			**	**	**			**					70-85*
Lettuce	***	***	***						***	***			45-80
Mustard greens	*	*	*						*	*	*		35-50
Okra			***	***	***			***				**	40-60
Onions sets												**	120-150
Peas, English	*	*								*	*		60-70
Peas, sweet (flowers)										*			120
Peppers, bell			**	**				**					60-80*
Potatoes, Irish	*	*	*						*				90-120
Radishes	*	*	*						*	*			22-28
Shallots	**	**							**	**			50*
Squash/ zucchini			***	***					***				50-80
Strawberries									**	**	**		90-120*
Tomatoes			**	**				**					55-75*
Turnips	*	*							*	*	*		40-50

*Please note, watch your local weather forecast. Schools in central and northern Louisiana may not want to plant some warm-season crops until April 1. However, some schools in coastal Louisiana can plant warm-season crops as early as late February. The dates above are GENERAL guidelines. Some years you may be able to plant early, and some years you may need to wait a little later. Watch your local forecast.

** The days to harvest a crop depend greatly on the specific variety planted, the weather at the time of planting and growing and, finally, on how you started the crop as a seed or a plant in the garden. Those crops with an asterisk (*) after the number of days from harvest are assuming you started with a seedling and have not direct-seeded the crop.

Starting Seedlings in Your Classroom

In Louisiana, the following vegetables should be planted as transplants into a school garden: broccoli, cabbage, cauliflower, bell peppers, eggplant, shallots and tomatoes. There are several benefits to transplanting these crops rather than directly planting seeds into the garden. Using transplants minimizes the number of seeds lost because of weather conditions, extends the growing season (which is important in school gardening when students are out for the summer) and gives students daily opportunities to watch the germination of a seed.

Potential Problems:
Two major factors that need attention when starting transplants for a school garden are light and preventing damping-off disease.

Before you begin seeding your transplants, clear a space near a large, well-lit window. If you do not have a well-lit window, purchase fluorescent lights to place directly above your transplants. Leave the lights on throughout the school day. Simply turn on the lights when you arrive and turn them off when you leave for the day.

To prevent damping-off disease, use clean, sterile media. Media (bagged potting soil) can be purchased from your local garden retailer. Do not purchase media that has a high percentage of bark in it. Bark ties up nutrients, making them unavailable to vegetable transplants. Use media that is mostly peat based.

Containers:
There are several options when purchasing containers to grow your transplants. The first type is typical plastic flats or cell packs. The best size for a cell pack is a jumbo six-pack that usually has 36 cells per flat, meaning that you will grow 36 plants per flat. You also can use peat pots or peat pellets, which are planted directly into the ground. They are made of compressed peat moss. Peat pots and pellets have advantages and disadvantages compared to plastic flats and cell packs. Peat-based containers are environmentally friendly. They degrade in the ground after being planted, and students are less likely to injure roots because they do not have to remove transplants from the containers. Disadvantages of peat-based containers are that they more expensive than plastic cell packs and flats and they cannot be used over and over again. On a budget? Use egg cartons, simply poke a hole in the bottom of each one. To save funds, recycled containers will work fine. Just clean them before planting fresh seeds into them and add drainage if it isn't already there.

Seeds:
Remember to think about varieties that are suited to your area when purchasing seeds. Most seed companies label their seeds with growing zones. Louisiana is in growing zones 8a to 10b. The majority of the state is located in zones 8 and 9. The southern portions of the state (south of New Orleans and all along the coastline) are in zone 10b. You will need to order seeds that survive in these growing areas.

Only purchase seeds from reputable sources. You want your students to succeed in the garden. There are so many factors you will have combat that you do not want to start your project with poor quality seeds. When purchasing, consider the age of the seed. Only buy fresh seed. Last year's seed is old and will not have as high of a germination percentage rate as fresh seed. (Seed sources also are listed on page 22 in this material.)

Timing:
Starting seeds at the proper time is a key to getting your transplants into the garden at the right time. The chart below includes several vegetables recommended by the LSU AgCenter that are commonly planted using transplants. It also shows the number of weeks in advance you will need to start your transplants. This, of course, means you must prepare make the appropriate preparation so you can plant at the right time.

Transplant Seeding Guide

Vegetable	Days to Emerge	Proper Soil Temperature	Weeks to Transplant
Broccoli, brussels sprouts, cabbage, and cauliflower	5-7	60-70°F	5-6
Bell pepper and eggplant	7-10	70-80°F	6-10
Shallots (cloves)	Purchase shallot cloves from your local garden retailer	Purchase shallot cloves from your local garden retailer	Purchase shallot cloves from your local garden retailer
Tomatoes	6-7	70-80°F	6-8
Cucumbers, squash, melons, pumpkin, zucchini	4-7	60-80°F	3-4

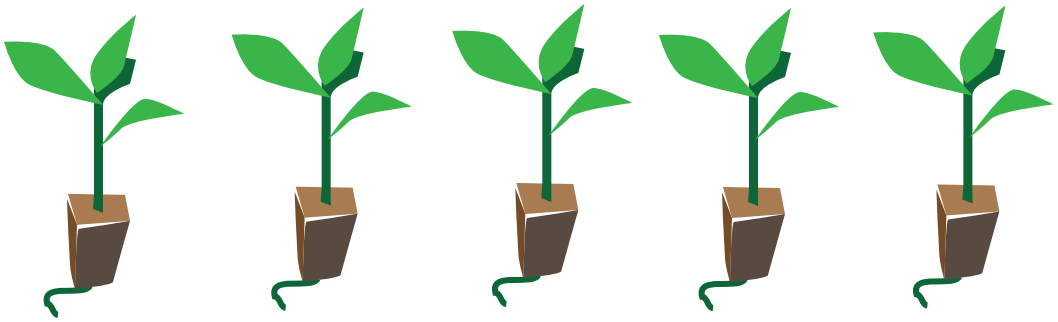
How To:
Once you are ready to start seeding, divide the class into groups of three to four students. Each group should have containers, soil, seeds, labels, pencils and access to water. It is best to seed transplants in an area that can get messy. Students should water the media in the pots before planting their seeds. The Students' Guide to Growing Vegetable Transplants worksheet on page 23 gives students step-by-step instructions for growing vegetable transplants.

Watering:
After the students have planted seeds in all their containers, you will need to discuss watering the transplants. Vegetable transplants like to be moist, but not wet. Too much water will cause damping-off disease.

Damping-off disease can be identified by looking at the base of the seedling. If it looks like it has been pinched and is leaning over, it has the disease and will never grow. It is best to pull the seedling and throw it away to avoid contaminating other seedlings.

Be sure water can drain from the containers. Do not overwater. Place your finger into the soil. Does it feel dry? If so, you will need to water. If it feels wet, however, do not water.

Never let your transplants wilt. Wilted plants are stressed and will not produce as much as plants that were not stressed. Keep a watering can or spray bottle near the transplants in your classroom. Before the seeds emerge from the soil, it is best to lightly mist them to prevent the seeds from washing away. After the seedlings have emerged and have their first true leaves, you can water with a watering can or hose.



Students' Guide to Growing Vegetable Transplants

Group Name: _____

Vegetables Seeded: Make a list of the vegetables your group is seeding in the box below.

Materials Needed: Make sure your group has containers, planting media (soil), spray bottles, seeds, labels and permanent markers.

Step-by-Step Directions:

1. Fill the containers with media (soil). Do not pack the media into your containers; they should be loosely filled.

2. Water your containers. Allow the water to drain from the bottom of the container. The soil should feel moist and not have any dry spots, but you do not want water sitting on top of your soil.

3. After the excess water has drained from your containers, plant seeds into each container. You should plant two seeds per container. Plant seeds only as deep as they are wide. Lightly cover the seeds with media. Do not leave the seeds exposed.

4. Make your labels. You should write your group name, date and type of vegetable you planted on your label. Place your label into your container.

5. Place your seeded containers in the area designated for growing transplants in your classroom. This should be near a bright window or under fluorescent lights.

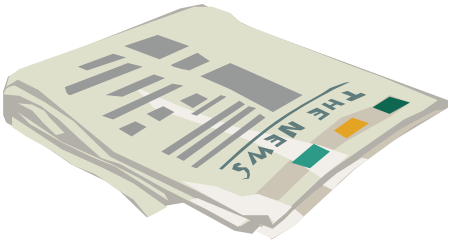
6. Water your transplants weekly until you take them out into the garden. Until your seeds emerge, mist them with water daily. After you can see several leaves, water them with a watering can.

7. About two weeks before you plant the seedlings into the garden, move your seedlings outside into a shady location. After one week in the shady location outside, place them into a sunny location outside. Remember to continue watering your transplants. This is called "hardening your transplants." Hardening transplants allows them to adjust to the outside weather conditions before they are planted into a garden. Hardening your transplants will give you stronger, healthier plants that will produce more vegetables.

Mulch for School Gardens

Mulches are excellent sources of nutrients and are weed barriers for your school garden. Work with students to collect mulch. Ask students to bring mulch from home. These are potential mulch materials that they may have at home.

Grass clippings
Brown leaves
Pine needles
Newspapers
Cardboard (large pieces only)



You may also consider black plastic over your rows as a mulch. Black plastic prevents weeds from germinating and holds in moisture and heat. You will need to lay drip irrigation underneath the black plastic. Follow these simple steps to lay black plastic in your garden:

Laying Plastic

1. Plastic mulch can be purchased at local nursery and hardware stores.
2. Build your rows.
3. Dig small trenches on either side of the rows.
4. Lay your irrigation lines.
5. Roll plastic over the top of each row.
6. Tuck the edges into side trenches. Cover with soil that was removed from the trench. Pull the plastic tight as you go down the row.
7. Bury the plastic on the ends of the rows.
8. Poke holes (only as big as the width of the transplant) along the side of irrigation line on either side of the black plastic.
9. Plant your transplants or seeds into the holes.
10. During the fall, paint the plastic with a 3-to-1 ratio of water to white paint and reuse it without pulling it up. Painting the plastic white allows you to plant fall crops in August and September when you return to school without burning them up from the extra heat.

Weed Management in the School Garden

The best weed management options for controlling weeds in a school garden are:

1. Mulching
2. Hand pulling
3. Cultivation

If you have done all of the above and still have weeds, you can consider using herbicides. HOWEVER, You MUST have approval from your school's IPM coordinator to use a herbicide. Each school has a different policy. Just because a herbicide is organic does not make it safe. YOU MUST HAVE APPROVAL BEFORE APPLYING. Then read the label and follow all directions.

If you want to use only organic herbicides to control weeds, you have the following control options:

1. Corn gluten meal, a pre-emergence herbicide.
2. Post-emergence organic herbicides, such as Scythe, Perfectly Natural Weed, Grass & Moss Killer or vinegar.

If you want to use conventional herbicides to manage weeds, you have the following control options:

1. Preen, a pre-emergence herbicide.
2. Post-emergence herbicides, such as herbicides with the active ingredient sethoxydim such as Post Plus Grass.

Pre-emergent herbicides are applied before you see weeds. These prevent weed seed from germinating.

Post-emergent herbicides are applied after you see the weeds. They must

be applied before the weeds go to flower, or they will not work.

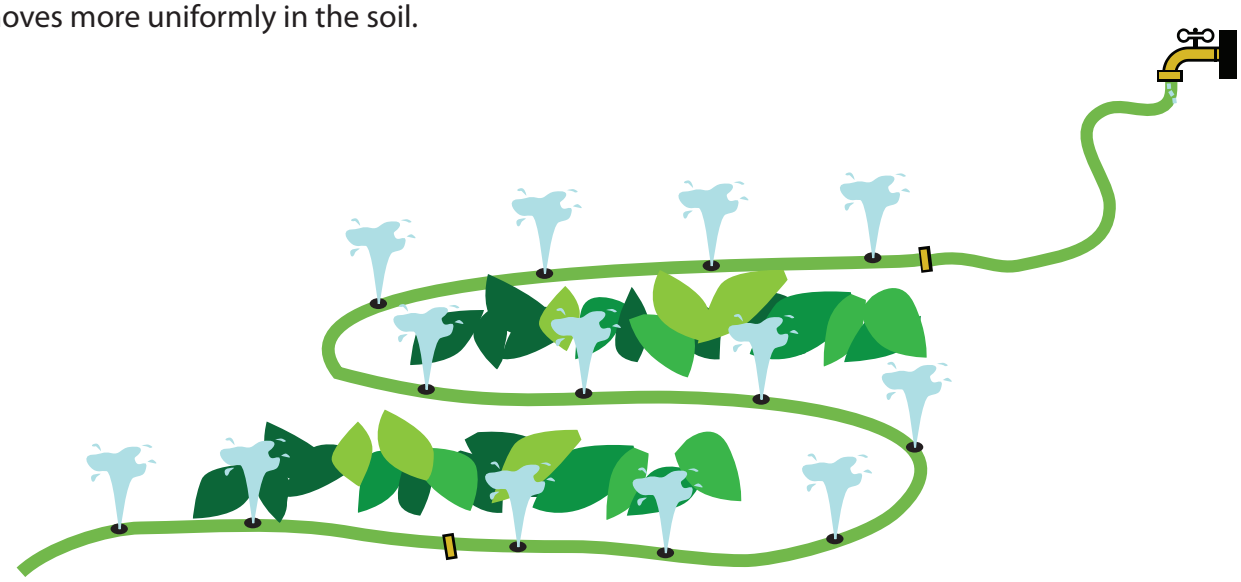
Watering Your School Garden

Louisiana typically is a wet state, receiving an annual statewide average rainfall of nearly 60 inches per year. Even with this amount of rainfall, however, it still is a good idea to install some type of irrigation system in your school garden.

Irrigation systems come in handy during the weekends, holidays and summer vacations when students and faculty generally are not at school.

Your school garden can have a simple irrigation system, an elaborate one or a variety of possibilities in between. Your irrigation needs will depend on the size and shape of your garden beds. The different types of irrigation systems are:

Option 1. Drip hoses can be placed in all garden beds.
Attach a regular hose to the outdoor faucet. Once it reaches your garden, connect it to a drip hose. Bury the drip hose 1 inch under the soil so the water moves more uniformly in the soil.



Option 2. Hoses with nozzle and sprinkler attachments can be used in a school garden.
These are easy to use, but there are some disadvantages to this type of irrigation system. You must drag the hose and sprinkler out to the garden each time you water. Leaving it strung out across the school yard can be a trip hazard or may lead to it being mowed over with lawn equipment. It is a cheap and effective irrigation method, but it is not the best as plants should be watered at the roots. Getting the foliage wet can

increase the chance of disease.

Option 3. A riser system.

A timer is connected to an outdoor faucet. From the timer, plastic hoses are laid throughout the beds. Risers with spray nozzles can be installed along the plastic hoses as needed. Risers and nozzles usually screw into one another. The risers are connected to the plastic hoses by using a small tool (usually provided with the irrigation system equipment) to pop a hole in the plastic hose. The riser is then connected to the hole. Spray nozzles can spray in arrays from 360-degree to 90-degree angles. They also have varying spray diameters. You will need to sketch a drawing of your garden space with all dimensions before going to an irrigation supply store. Irrigation supply stores usually can design a quick irrigation system on the spot.

Fertilizing Your School Garden

Proper fertilization of your school garden will increase yields and also decrease plant susceptibility to diseases and insects. Fertilization in the school garden can be simple. You can follow these two steps for your fall and spring school gardens.

STEP 1: Before Planting

Before you plant your garden, you should apply a complete fertilizer. A common complete fertilizer used in vegetable gardens is 13-13-13. Of course, you can use other sources as well, even organic sources. But please stay away from manures in a school garden to decrease the potential of a human-borne illness. Complete fertilizers supply an equal amount of nitrogen, phosphorus and potassium to the plants. Generally, the pre-plant fertilizer is applied one to three weeks prior to planting your vegetables. The pre-plant fertilizer is applied in a band about 6 inches deep in the row or scattered throughout the bed into the top 3-4 inches of soil. You must have moist soil when planting your transplants after applying the pre-plant fertilizer. You should be able to take a handful of soil and squeeze it, and if it forms a loose ball, there is plenty of moisture in the soil. If the soil is dry when you plant after applying fertilizer, you will burn up your plants!

STEP 2: When the Flowers and Fruit Begin to Develop

As the flowers begin to develop, the nitrogen requirements of vegetable plants increase. That is the time to side-dress. This usually occurs a month after planting. Side-dressing is applying a small amount of fertilizer in between plants along the side of the row (about 8 inches away from the plants) and within the top 4-6 inches of the soil. Like pre-plant fertilizing, you need to apply water soon after you side-dress to prevent the plants from being burned by the fertilizer. Generally, ½ of a teaspoon of calcium nitrate is put into the side holes every 12 to 18 inches.

Wait! What if I am growing leafy vegetables that only flower near the end of their life? Leafy vegetables such as cabbage, cauliflower and broccoli, lettuce, kales and chards are fertilized two to three weeks after planting and again two weeks after that.

Staking Vegetable Plants

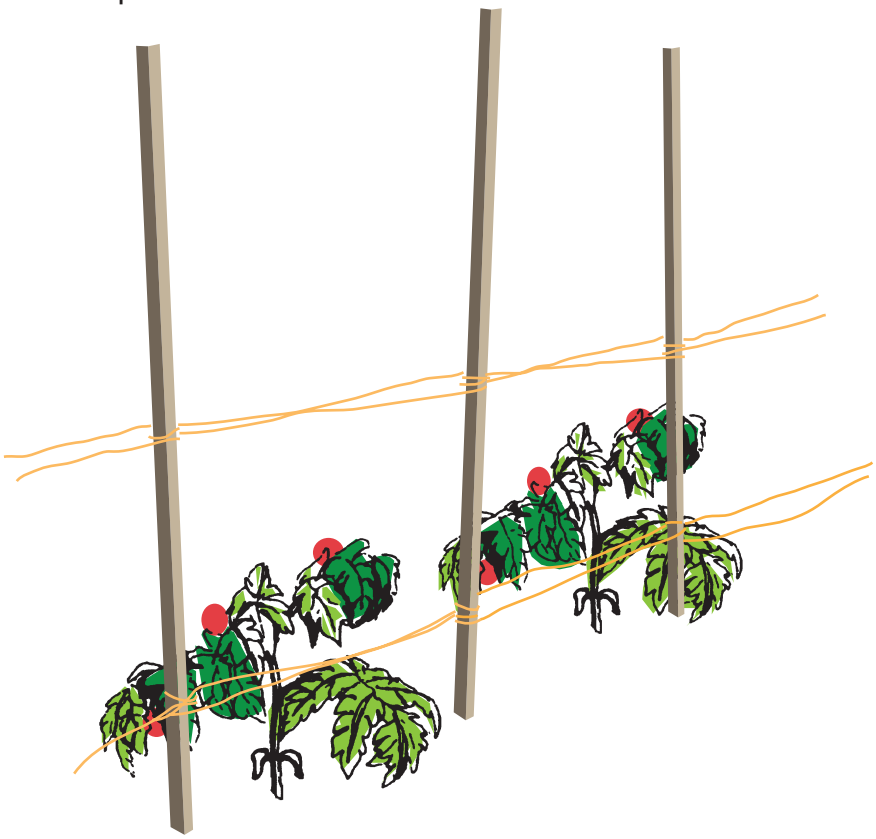
Certain vegetables growing in a school garden will benefit from being staked. Staking a plant gives it extra support when it is heavy with fruit. The proper ways to stake plants are:

1. Cages

Cages, commonly called tomato cages, are excellent stakes for plants like tomatoes, eggplants and peppers. Tomato cages range in price from $4 to $20 each, and they can be reused year after year. They generally are made of heavy wire. The cage is placed into the ground around the plant while the plant is still small. The leaves of the plant will rest along the wire of the cage. In winter conditions, light cloth can be placed around the cage to protect the plant from frost damage.

2. Using stakes and twine

Plants growing in straight rows can be trellised using rebar or long wooden stakes (generally 5-6 feet tall) and heavy twine. The stakes are driven about 10-12 inches into the ground between every two to three plants. A heavy twine is passed along one side of the stake and wrapped in a loop around each stake until you get to the end of the row. The same process is repeated on the other side of the row. Twine should run along the stakes at 10-inch intervals. It is best to start staking plants before they begin falling over. This usually occurs when plants are a little over 1 foot tall.



Vegetable Cards

Tomato
Lycopersicom esculantum

Staked

Spacing: 24 inches apart.

Variety in My Garden:

_____

Radish
Raphanus sativus

Spacing: 24 inches apart.

Variety in My Garden:

_____

Bell Pepper
Capsicum annuum

Staked

Spacing: 12-18 inches apart.

Variety in My Garden:

_____

Lettuce
Lactuca sativa

Spacing: 6-9 inches apart.

Variety in My Garden:

_____

Vegetable Cards

Beans (Lima)
Phaseolus lunatus

Spacing: One bean every 2-3 inches.

Variety in My Garden:

_____

Beans (Snap)
Phaseolus vulgaris

Trellised: Three poles form a teepee and are tied together at the top with string.
Spacing: Four to five beans per hill, 6-12 inches apart

Variety in My Garden:

_____

Beets
Beta vulgaris

Spacing: Plant seeds in a row. Once the plants have emerged, thin them to 3 inches between plants.

Variety in My Garden:

_____

Broccoli
Brassica oleracea

Spacing:12-18 inches apart.

Variety in My Garden:

_____

Vegetable Cards

Cabbage
Brassica oleracea

Spacing: 10-18 inches apart.

Variety in My Garden:

_____

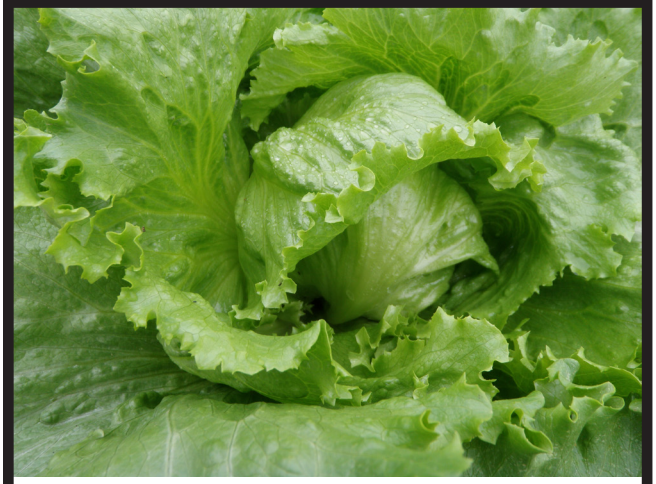
Cauliflower
Brassica oleracea

Spacing: 10-18 inches apart.

Variety in My Garden:

_____

Greens
Brassica spp.



Spacing: Plant seeds in a row. After the plants have emerged, thin to one plant every 3 inches.

Variety in My Garden:

_____

Cucumbers
Cucumis sativus

Trellised

Spacing: Hills (with three seeds) 8-12 inches apart.

Variety in My Garden:

_____

Vegetable Cards

English Peas
Pisum sativum

Trellised
Spacing: Plant seeds in a row. Once the plants have emerged, thin to one plant every 3 inches.

Variety in My Garden:

_____

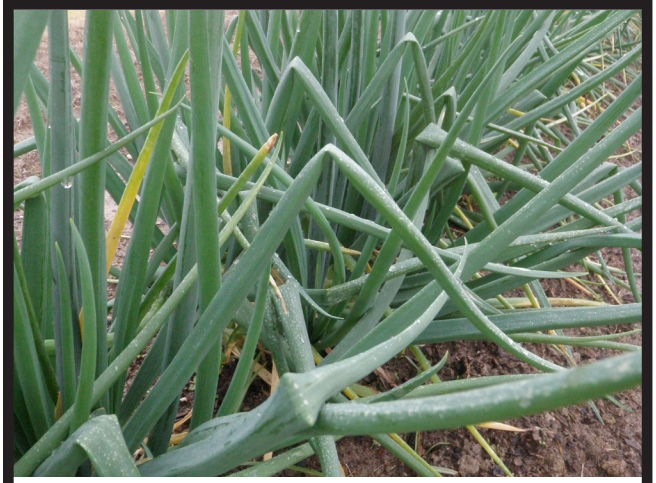
Irish potatoes
Solanum tuberosum

Spacing: 12-24 inches apart.

Variety in My Garden:

_____

Shallots
Allium oschaninii



Spacing: 6-8 inches apart.

Variety in My Garden:

_____

Turnips
Brassica spp.

Spacing: 2-3 inches apart.

Variety in My Garden:

_____

Vegetable Cards

Carrots
Daucus carota

Spacing: Place seeds in a straight line. After the plants have emerged, thin to 2 inches between plants.

Variety in My Garden:

_____

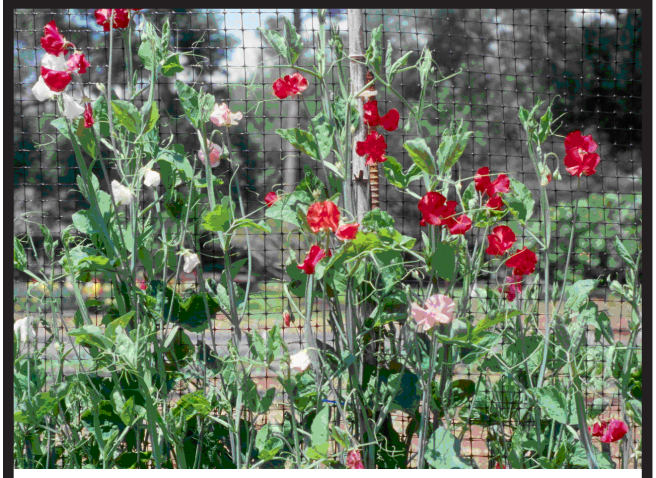
Strawberries
Fragaria spp.

Spacing: 14-16 inches apart.

Variety in My Garden:

_____

Sweet Peas
Lathyrus odoratus



Trellis on a fence
Spacing: Place seeds in a straight line. After the plants have emerged, thin to 4 inches between plants.

Variety in My Garden:

_____

Vegetable_____
Scientific name _____

Trellis? _____

Spacing: _____

_____

_____

Variety in My Garden:

_____

Materials for a School Garden

1. Tiller — Borrow from a parent if not in the budget.
2. Shovels
3. Rakes
4. Trowels
5. Hoes
6. Sprayer — Use separate sprayers for herbicides and fertilizers.
7. Measuring cups
8. Fertilizer
9. Gloves
10. Wheelbarrow
11. Buckets
12. Hoses
13. Watering cans
14. Irrigation system — Not necessary, but you will need a hose and buckets if you do not have an irrigation system.
15. Timer — Only if you have an irrigation system.
16. Benches — For students to sit on to use the garden as an outdoor classroom. This is not necessary but would be helpful in the long run.
17. Storage shed — Unless the garden is close to the classroom and the students and teachers can carry supplies back and forth from the garden site.
18. Seeds or transplants
19. Soil
20. Seed trays
21. Labels — For trays and garden spaces.
22. Pencils — Pencils do not wash off in the rain or fade in the sun on plant labels.
23. Paints — To make signs in the garden.
24. Rain barrels
25. Compost bin
26. Trellis system — Tomato cages or rebar and string for vegetables like tomatoes, peppers, eggplant, cucumbers, gourds, etc.
27. Mulch — Not wood chips.
28. Scarecrow (optional)
29. Wood — For raised beds, use two-by-12 boards at the length of your choice. Two-by-12s that are 8 feet long are recommended. Three will make one raised bed. Contact a gardening expert if you need instructions.
    You will also need:
    a. Saw, hammer and other tools
    b. Nails or screws
30. Greenhouse (optional)

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