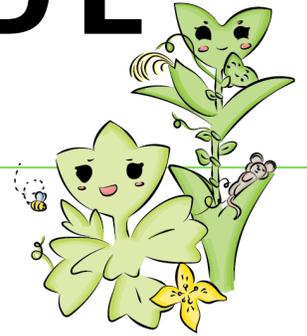


GARDEN GUIDE

The STEM Coach's Resource for Gardening

STEPS TO GET YOU STARTED



Gardening is a great way to get kids outside and into the earth! It is fun and exciting, because it allows the kids to see first-hand where their food comes from, and it teaches them that hard work can bring forth great satisfaction and reward. Gardening is also a wonderful avenue for students to develop confidence, competence, patience, and independence. These are skills that will serve them throughout their lives.

Throughout Gardening Month, the STEM Coaches will assist the students in cultivating their very own garden! STEM Coaches will be there to guide the students and give support when needed, but this project will be predominantly student led! STEM Coaches will also be there to promote a positive and uplifting environment as they encourage the students, and help them to make gardening an enjoyable experience!

Every school will be in a different situation regarding the state of their gardens. Use this guide, and choose what your school needs from it to aid in creating a successful gardening experience for your students!



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You will need:

Tools: Hand trowels, Full size round pointed shovels, hoes, metal rakes, hand weeders, wheelbarrows, watering cans, cart or wagon for hauling tools, trash bags for weeds and debris.

* If your school doesn't have all of these tools, that's okay, but maybe you can add a few new tools to your collection.

Soil amendments: Dirt/compost, bags of soil to top off garden beds, fertilizers.

Seeds: Vegetable/ herb/ flower seeds, such as: carrots, beets, radish, peas, cucumbers, guards, tomatoes, peppers, basil, rosemary, thyme, sunflowers, zinnias, marigolds, etc.

* These are some suggestions of seeds to purchase. Purchase seeds, and students can choose from those seeds what they want to go into their garden.

Other: Wooden garden stakes, wood glue, seed starter trays or dixie cups, 120-200 grit sand paper, paint brushes, wood sealer, cheap plastic gloves, wooden dowel or paint sticks, large disposable cups, garden bed kits, and tools required for assembly.



Plan your garden:

What you will need:

Student sheets, pencils, wooden stakes, large popsicle sticks, wood glue, markers or acrylic paint, paint brushes

What you will do:

Say: "An important first step in cultivating a successful garden is to begin with the end in mind. This is done by thoughtfully planning your garden."

There will be about six students per garden bed. Students get to choose their garden groups, and will begin planning their gardens. Ask the students guiding questions as they plan their gardens.

Say: "Think about what you want from your garden. Decide what you would like to grow."

- Do you want a mix of vegetables, herbs, and flowers?
- Do you want to grow only a flower or herb garden?
- Do you want to possibly grow a salsa or a butterfly garden?

Say: "Next, think about the design. As you think about the plants that you have chosen to grow in your garden, ask yourself some questions, and do some quick research to find the answers."

- Where do you think it would be best to plant the types of seeds, or sprouts that you want to grow?
- Do you want to make a design with your plants?
- Where do you think it would be best to plant certain plants?

Different plants have different needs. Some plants, such as sugar snap peas, may grow tall, and will need a trellis. These plants will be best suited along the outside edge of a garden bed, along the shorter end. This way, a trellis may be added to guide the plant as it grows, but will not block access the the rest of the bed. Some plants, such as squash or pumpkin, require more space. Make sure to plant these farther apart from other plants, so they have room to grow. Vegetables that are smaller, such as, carrots, radishes, or beats, can be planted close together.



Plan your garden continued:

The students will choose a name their for their garden, and they will fill out their garden map. Every group needs to submit one garden plan with all of their names on it. STEM Coaches will display the garden maps.

After each group has completed their garden plan, they get to make a fun sign for their garden!

1. Each group will get a wooden stake, and everyone in the group will get a large popsicle stick. They can decorate their popsicle sticks with their own name, and the name of their garden.
2. They can each decorate a popsicle stick with markers or acrylic paint. If students are able to use paint, then this would be a great activity to do outside!
3. After all of the popsicle sticks are ready, the students can glue them onto the wooden stake.
4. Allow the students to put up their garden signs on another day.



Prepare your seeds:

What you will need:

Seed trays or dixie cups, soil, containers of water, Pippi Pipettes, seeds

What you will do:

A great way to get the most out of the growing season is to start your seeds early! The students can begin growing their seeds indoors, and then transfer them into the garden after the last frost date for the season. This will allow them to enjoy the garden as long as possible, and grow strong and healthy plants!

Starting seeds is easy! Here are some fool proof steps to follow that will get the garden off to a great start!

1. Fill your seed trays or dixie cups with the soil. Gently tap them against the table to help the soil settle, and add more as needed.
2. Moisten your potting soil. You will want it to be thoroughly damp, but not totally drenched. Students can use Pippi Pipettes to moisten soil in a controlled way.
3. Plant and label your seeds. The seed packet will tell you how deep to plant your seeds. A good rule of thumb is to plant them about 2-3 times as deep as the longest side. You can easily make a hole with either your finger or the end of a pencil. You will want to label your trays or cups with the type of seeds you plant as you plant them, along with the date you planted them on. This will help you remember what you planted, and how much time has passed as your seeds grow to maturity.
4. Water your newly planted seeds very lightly.
5. Next, find a warm spot near a window to place your seed trays or cups. Optimally, the temperature for the seeds will be around 70 degrees Fahrenheit. If you have seed trays that have come with a cover, you can place the cover on at this time.
6. Check the soil every day for moistness, and water as needed. Be sure to not over water. Make sure to water the seeds well before the weekend.
7. If you have a plastic cover over your seed trays, remove it when the seeds have sprouted.
8. Continue to monitor your sprouts. Ensure they have adequate light and water.
9. When the sprouts have grown to a good size, the last frost date has passed, and the garden beds are ready, you will want to "harden off" your plants. A sudden change in temperature can harm them. A good way to do this is to set your plants outside in a safe and sheltered place for a few hours each day, until you are ready to plant.



Construct the garden beds:

What you will need:

Garden bed kits, tools needed for assembly, measuring tape

What you will do:

Say: Raised garden beds are a wonderful addition to any garden. They have many benefits. Raised garden beds provide a controlled space for plants to grow above ground. This helps cut down on water usage, it helps with weed control, and it is can be useful in providing a way to garden more efficiently. The beds are large enough to hold a variety of plants, while being just wide enough to reach in to the bed from either side to tend to your plants, without the worry of stepping on the plants or compacting the dirt and damaging the developing root systems. These are just a few of the benefits of raised garden beds.

If your school decides to purchase raised garden bed kits for the students there are a few things to know before hand. Here are some things to think about:

- Choose a space to transform into a garden. Measure the space to ensure all of your garden beds will fit. Make sure that the space is level, because the raised beds will need to be placed on a level surface.
- You will need 1 raised garden bed for approximately every 6 students.
- Optimally, purchase cedar wood garden bed kits that are between 6 and 8 ft long, and 3 to 4 ft wide. Cedar wood lasts longer than other types of wood.
- Keep in mind that there are draw backs to purchasing plastic or metal raised beds. Plastic breaks down in the sun, and will not last more than a couple of years, and metal can become very hot. This is why we recommend cedar wood raised beds.

Have the students get involved in putting the raised garden beds together. Have them follow the instructions. Assist and encourage them as they work together to construct the garden beds!

Refer to the Gardening Month Materials List for links to garden beds we suggest.



Sand and coat the wooden garden beds:

What you will need:

120-200 grit sandpaper, plastic gloves, cheap paint brushes, some sort of non-toxic outdoor wood protective finish, wooden dowel or paint stick, and large disposable cups for the protective finish.

What you will do:

This step is an important one for the programs who have either just constructed new wooden garden beds, or already have wooden garden beds in place from previous years. Taking care of the raised garden beds will help them have a longer lifespan, and will ensure they are in good shape for daily use by the students. Make sure to have the students sand and coat the beds with a clear, outdoor protective sealer for wood, every year before planting the gardens.

Here are the steps to sand and coat the wooden raised garden beds:

1. Prep all of the supplies the students will need for the project. You can cut the sandpaper into smaller squares for students if the sandpaper comes in large sheets.
2. First, have the students sand their raised garden boxes. Encourage them to lightly sand them just enough to smooth out any rough spots, or splinters, and to prepare the wood to have the protective coat painted on.
3. When all of the boxes have been sanded, have the students take a rag or paper towels and clean off any dust particles. The wood will need to be clean and dry for the next steps.
4. Stir the clear protective coat for a minute or so with the wooden stick until it is mixed very well and without any clumps. Pour it into large disposable cups for the students to take to their garden boxes.
5. Show the students how to paint the wood in the direction of the wood grain. Remind them to paint it on evenly so there aren't spots that are too thick or too thin.
6. Allow coats to dry according to what it says on the can, and then apply a second if needed.

Thank the students for their hard work! Let them know that creating and sustaining a garden requires a lot of teamwork. But the fruits of their labors will make it all worth it! Because of them, their plants can have a beautiful place to thrive!



Find an empty or abandon garden bed/planter/or dirt plot to transform into a garden:

What you will need:

Garden tools: Full size round pointed shovels, hoes, metal rakes, hand weeders, wheelbarrows, watering cans, cart or wagon for hauling tools, trash bags for weeds and debris. * If your school doesn't have all of these tools, that's okay, but maybe you can add a few new tools to your collection.

What you will do:

For the schools without garden beds, all is not lost! Your students can still develop a thriving garden if they have access to an abandoned garden bed, planter, or flat spot on campus!

If the students have access to an abandon planter or garden bed, then follow the instructions in this guide to nourish the soil and prepare the garden for planting.

If the students are able to work with a dirt plot, then here are some things the students can do to turn it into a garden:

1. Choose a plot that is level.
2. Students will need a few full size round pointed shovels if they are preparing the ground for the first time. They will need these to dig in and pull up any grass or weeds.
3. Weed the area. If the area is too dry to successfully pull the weeds, then watering the ground can be a helpful way to soften the dirt.
4. Stake out garden plots that are about 4x6 or 4x8 feet.
5. Follow the instructions to till the ground, and add soil amendments to nourish the plots.

*Be careful to look out for ants when choosing a spot.

*If they are preparing a plot for the first time, it might take a few days and it will be hard work. Continue to encourage the students. Bring them treats to thank them for their hard work.



Weed the garden:

What you will need:

Trash bags, and tools such as, hand trowels and weeding tools.

What you will do:

Weed mitigation may not be a crowd favorite, but it is an important task when caring for a garden. Weeds have a tendency to take over and choke out the plants in a garden. They seem to come out of nowhere and spring up over night. As you can imagine, keeping the garden as weed free as possible will give your plants the best chance they can have at a healthy life. Plus, keeping the weeds out of your garden will keep it looking great!

Here are some tips for weed pulling:

- The goal with weed pulling is to get the root out of the ground to prevent it from continuing to grow and spreading.
- Moisten the dirt if it is very dry. This will help to loosen the dirt and more successfully get the roots out of the ground.
- Use tools like a hand trowel or a weeding tool to loosen up the dirt around the root.
- Have trash bags nearby to put the weeds and debris in as you clear the garden beds.

Another tip for keeping the garden weed free is to take a few minutes each week to pull any new weeds that are popping up. This practice will help both the garden and the gardener from getting overwhelmed.



Till the garden:

What you will need:

Tools such as, shovels, metal rakes, hoes, etc.

What you will do:

If your garden has already been established in previous years, then this step is a good one to follow. Till the dirt after the weeds and other debris have been cleared from the garden.

Tilling is the act of turning over the dirt with garden tools. Tilling helps to break up and loosen dirt that has been sitting for awhile. Tilling is also a good preparatory step when preparing to add compost, soil, and other amendments into the dirt.

- Take garden tools, like shovels, metal rakes, hoes, etc. and use them to break up the top 8 to 12 inches of dirt in the garden beds.



Add soil amendments:

What you will need:

Your choice of: Compost, soil, and fertilizer, as well as shovels a wheelbarrow

What you will do:

Whether the students are just starting a garden, or revitalizing the garden from the year before, a key component of any healthy garden is the soil. A garden is only as good as the nutrients in the soil. An advantage of having newly constructed garden beds is that you can choose what goes into it. Essentially, you can create an optimal environment for plants to grow.

The nutrients in established garden beds can become depleted over time, so it is always a good idea to top off soil with a fresh layer of nutrients.

For either situation there are a few ways to create and support a healthy garden environment. Here are some ideas to get you started:

- Compost is made up of natural material that has broken down over time. It is very nutrient rich and full of nitrogen, which is very important in the growth a healthy garden. Adding compost to soil is not only great for the plants, but it also helps to feed the soil and support a healthy soil microbiome. This can be purchased in bags at a supply store. It is also possible that a local bulk yard may supply compost.
- Local bulk yards may also carry a soil mix specifically designed for gardens. They are often made up of a mix of soils. These can be a good choice, but the nutrient content is often unknown, so it is best to use this as a filler for the boxes and then use bagged soil and/or compost to mix into the top six or so inches of the garden beds.
- Bagged soil for gardens, such as Miracle Gro, often have compost and fertilizer mixed in to the soil. This is a great option to use to give any garden a boost. This can be purchased at supply stores.
- Fertilizer helps support the growth of plants. This can be a great way to add essential nutrients to the soil, if it is needed. One draw back of fertilizers is that it only feeds the plants, but it does not feed the soil. Fertilizers can be purchased at supply stores.



Add soil amendments continued:

*When shopping around for soil mixes it can be helpful to call the bulk yard and have them talk you through the soils they carry. They can also help you figure out how much you will need to fill all of the garden beds.

*If you do not have access to a truck to up dirt/compost, then you can ask if the bulk yard will deliver, or ask for a parent volunteer with truck to pick up a load and bring it to school.

Plant the garden:

What you will need:

Garden plans, sprouts, seeds, watering cans, hand trowels

What you will do:

Say: "Great job! All of your hard work is paying off! The garden is now ready to plant!"

1. Have your students get into their garden groups and pull out their garden plan. They can have some time to revise the plan if needed.
2. Students will haul the sprouts and garden tools out to the garden.
3. Next, fill the watering cans with water.
4. Each group will take the sprouts they have been growing, and they will get to plant the sprouts in their garden beds!
5. Use hand trowels to create a hole to place your sprouts in. Fill the hole with water. Gently remove the sprouts from the containers, and place them in the hole. Cover the roots with soil, and lightly water your newly planted garden!
6. If there are extra seeds and space in the garden beds, students may want to plant seeds into their garden beds. They are welcome to do so.
7. Have students label their plants and seeds. They may use the markers they have previously made, or make new ones.

Say: "Everyone will get a chance to use the watering cans. Remember to take turns. Be kind and share the watering cans between planting your plants."



Taking care of the garden:

Say "Congratulations! The garden has been planted! The next step is to keep the garden alive and thriving!"

Here are some tips to help in this endeavor:

- Remember to water the garden frequently and properly.
- Take a few minutes each week to pull out any weeds.
- Tend to the plants needs. Add a trellis, tomato cage, etc. when needed.
- Clean the garden tools to prevent the spread of any diseases that may be present.
- Maintain plants by pruning back dead or unhealthy leaves and branches.

Keep up the great work! The more love and time the students give to the garden, the more the garden will give back to them! Soon everyone will be reaping the rewards of their efforts!

Add to the garden:

As the garden grows, there are some things that can be added for function and for fun!

Some plants may need a trellis. Things that can be used to make a trellis might include: wooden dowels, bamboo, wooden stakes, and twine to tie up and guide growing plants.

Keep the plants labeled. Students can make labels with large popsicle sticks and permanent markers, or they can paint rocks with the name of the plants and even a picture of the plant!

Make a rock garden! Designate a specific area for a rock garden! You can mark it off with a homemade fence is necessary, such as with wooden stakes and twine. Or the students can line the paths between the garden beds with their painted rocks! Students can paint rocks throughout gardening month to add to and "grow" the rock garden. They can be creative and paint pictures and quotes.

Add decorations to the garden to make it more inviting and cheerful! Allowing the students to make the garden their own can help it to feel more special and important to them. Hang metallic or colorful streamers in the tree, add a design with string on a fence, set up a scarecrow, make homemade windchimes to hang in a tree, etc. The possibilities are endless!

