Lesson Seven: How do you plant a garden the second year?

For March

“Planting Our Healthy Garden” from GROWING IN THE GARDEN: LOCAL FOODS AND HEALTHY LIVING, Iowa State University Extension and Outreach. It’s time to plant the garden you’ve been planning. Depending on your location, you may need to wait another month before planting. Students learn about creating a seed to seed cycle model and learn about the the food system by planting, watering, maintaining and eating goods grown in the garden.

Content objectives: Mark a garden; Plant seeds, sets, or transplants; and water the garden for the first time.

Life Skill objectives: Healthy lifestyle choices, Critical thinking, Communication, Citizenship, Leadership, Decision making,

Core and STEM concepts and skills:
Science Science as inquiry, Earth and space, Life science
Math Operations and algebraic thinking, Numbers, Measurement and data, Geometry, Mathematical practices
Language Arts Reading for information, Vocabulary, Speaking, Listening, Viewing

Healthy snack: Water and a simple fresh fruit or vegetable snack with or without dip

Additional and supporting resources: Cooperative Extension Master Gardener’s Program can be a resource for planting your garden.
# LESSON PLANS FOR 2012-13 SCHOOL YEAR, GRADE 3

## March:  How do you plant a garden the second year?

<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Plan Outline: Before, The Lesson, and After</td>
<td>2</td>
</tr>
<tr>
<td>Gardening Tips for Working With Kids</td>
<td>4</td>
</tr>
<tr>
<td>Healthy Gardens, Healthy Youth Partnership</td>
<td></td>
</tr>
<tr>
<td>How do you plant a garden?</td>
<td>8</td>
</tr>
<tr>
<td>Iowa State University Extension and Outreach</td>
<td></td>
</tr>
<tr>
<td>Lesson: Planting Our Food Garden</td>
<td>13</td>
</tr>
<tr>
<td>Growing in the Garden: Local Foods and Healthy Living</td>
<td></td>
</tr>
<tr>
<td>Iowa State University Extension and Outreach</td>
<td></td>
</tr>
<tr>
<td>Garden Journal: See the Before section of the Lesson Plan</td>
<td>2, 31</td>
</tr>
<tr>
<td>Recipe: Healthy Snacks (See Before, #7)</td>
<td>2, 3</td>
</tr>
</tbody>
</table>
BEFORE THE LESSON

1. **Grade 3, March: Planting the Garden, 2012-13 School Year**
   This document contains all the curriculum items and resources you need for this lesson. All lesson downloads are located on the [www.peoplesgarden.wsu.edu](http://www.peoplesgarden.wsu.edu) Educational Toolkit. Please read through everything well in advance of delivering this lesson.

2. **Gardening Tips for Working With Kids**, Healthy Gardens, Healthy Youth Partnership
   **How do you plant a garden?** Iowa State University Extension and Outreach
   Master Gardeners and extension educators created the tip list based on their experiences gardening with kids for this project and for related summer programs. You may want to make a copy to keep handy throughout the gardening season. The garden planting document provides information about garden seeds and plants, tools, planting times, and a garden plant shopping list. You may want to read through it to do an inventory of garden supplies and fill in the gaps.

3. Check with Extension or gardening experts to find out when you can plant cool season and then warm season crops in your region. If you can’t plant in late March or early April, please do a lesson you missed in the fall or trade this lesson with the April lesson.

4. Please follow-through with the notes from your January garden planning session.
   What changes are you incorporating into your garden?
   What did the students decide to plant and why?
   Is it a cool or warm season crop?
   Where are you planting and what method are you using? (Square foot gardening or row gardens)
   Who are your garden helpers and how can you prepare them?
   Are the planting supplies ready to go?

5. Make sure you have all the supplies you will need to do the lesson, plant the garden, drink water, and eat a healthy snack.

6. **Garden Journal**
   If they haven’t done so already, this is a good time for each student to start his or her own Garden Journal. Each time you do a lesson or go out in the garden there is an opportunity to add something new to the Garden Journal. Provide 1” vinyl binders or sturdy plastic folders with 3-ring binders so that students can take their journals to the garden and add pages, activity sheets, charts, recipes, etc. The binders with a clear sleeve on the front are nice because students can design their front cover on a heavy piece of paper and slide it into the sleeve. The students can also design their own inside cover page. Provide permanent markers so they can at least creatively write the title, using their first and last name such as “Charlie Smith’s Garden Journal”, on the front of the binder or folder. We have found that it works best to collect the journals after each use. See The Lesson Section, Garden Journal Page, for more details. Your Extension organization may have additional suggestions for garden journals.

7. **Recipe:**
   Since planting the garden takes quite a bit of time and clean up, we are suggesting water and a simple fresh fruit or vegetable snack with or without dip. Students can help prepare the snacks before planting the garden. The snacks and dips can be chilling and ready when the students are done gardening. Here are some simple dip recipes or you can buy dip – try to keep it low fat.
Quick Fruit Dip
In a small bowl, mix 1 cup of plain yogurt with 2 tablespoons of brown sugar.

Zippy Vegetable Dip
1. Combine 1 cup of low fat cottage cheese, 1 cup of plain yogurt, and a 1-ounce package of dry ranch dressing in a blender. If you don’t have a blender, use a mixer.
2. Blend on medium speed approximately 30 seconds or until the mixture is smooth. Stop the blender a few times to scrape the mixture down the sides. If it is too thick, thin it with 1 or 2 tablespoons of skim milk or buttermilk.

THE LESSON
1. You may want to work on the Planting Our Food Garden lesson over a period of days. The outline below provides ideas so that you can determine how and when you want to complete the lesson. The activities in this lesson help students to understand how their food grows, what they need to plant food, and how to work together in the garden. There are sections that you may skip because of the type of garden you are planting and whether you are planting your own transplants. Here is a basic outline of the lesson.

Introduction: Make Sunflower Seed to Seed Cycles
(There are several books about sunflowers that you can read.)

Do: Seeds, Sets, Seed Pieces, and Transplants; Garden Matching Game (What are you planting in your garden and how should you plant it?)
Start Your Own Transplants (optional)

Reflect: Garden Tools and the Tool Safety Game
Making Garden Labels
Making Dibbles

Apply: Establishing Garden Rules
Planting your garden (choose the type you are working in)
We Need Water and Energy, Too! (water and fruit or vegetable snack)
Garden Journal Page

AFTER THE LESSON
You may want to add more pages to the Garden Journals so they can use their journals to do gardening at home. Here are some page ideas:
   a. Draw or right down how each plant was started (as seeds, sets, seed pieces or transplants) and how deep they planted them.

   b. Make predictions, with or without reading the seed packet, about when they will see the sprouts coming up out of the soil.

   c. Write the dip recipes down so that they can make the dips at home.
USDA FNS People’s Garden School Garden Pilot Project:
Healthy Gardens, Healthy Youth

Tips for Working with Kids and the Garden

The following tips are from HGHY Master Gardeners and site leaders and are based on their experiences gardening with kids. These are tips for both school and the summer programs. A sample in-garden lesson outline can be found at the end of this document.

Be Prepared
- Send home information about the garden program including the details about who is leading the program, what the kids will be doing, where the gardens are located, when the kids will be gardening, what is happening with the garden produce, and expectations of the young gardeners. All gardeners should be wearing close-toed shoes and have sun protection. They will not be allowed to work in the garden or with food if they are sick or have been sick within the last 24 hours.
- Every time you go to the garden, take supplies such as a first aid kit, wet wipes, water jug with cups (or have kids bring their own water) and water for washing the produce.
- Use lesson plans and educational resources to prepare for each session. Play a game, sing a song, act out a play, read a book, or make a garden-based craft each session. Remember to have fun! See the Sample Garden Session outline at the end of these tips.

Working With the Kids
- Make sure the young gardeners know the 3 R’s garden rules: Respect, Responsibility, Readiness.
- Be fully prepared before heading to the garden so there will be little down time for the kids. The tools and any supplies should be easy to access and ready to go. Break large groups into manageable sizes. Have more than one activity and rotate them. Keep every child busy and on task or their attention will shift and they will drift. Have enough adult supervision to make this happen.
- Always demonstrate before letting the kids work on their own. The more adult helpers you have to float around and guide the kids, the better. Do not do things for the kids, show them how and have them show you how back.
- Check their work. Don’t take their word for it when they say they have completed a task. You might find that things were missed.
- Take frequent shade and water breaks. Break times are good times to introduce healthy snacks, books, garden journals, or other hands-on activities.
- Every child will appreciate some one-on-one time with instructors while working in the garden. Let them tell their stories and show you the weeds they found and pulled, etc.
Planning the Garden

- Use the hands-on, deeply aligned classroom lessons to help the students plan their gardens. The kids will have fun learning and taking ownership of the garden. They will get excited about choosing what to plant and how much they need to plant by doing these lessons. A Master Gardener or an experienced gardener is a valuable resource to help kids discover what crops can be grown in the climate and in the amount of space they will have to garden. Start a Garden Journal or Garden Records right away.

- Young students are not able to prepare the site for gardening. Master Gardeners and others can provide leadership for that. FFA students, parents, Ameri-Corps, Food Corps, garden clubs, retired teachers, neighbors and others have been instrumental in preparing the gardens and helping the youth in the planning stages.

- For the young children, have the sections of the garden already measured out and marked according to the garden plan. For the older youth, help them measure and mark the garden sections.

- Kids like to use garden tools, but they LOVE to use child-sized tools such as kid-sized rakes, hoes, shovels, watering cans, and gloves. The type of garden tools they need depend on the type of garden they will be working with and how it is planted – square foot vs. rows. They can share tools. Older students have been using adult-sized tools and even tools that have been loaned by Master Gardener groups.

- Master Gardeners and FFA members are using their green houses to start seeds and grow transplants for the school gardens.

Help the students start a compost bin and get the whole school involved.

Planting

- Go over tool safety rules for hoes, trowels, and rakes. A tool safety game is part of the gardening curriculum.

- Go over ways the plants in your garden are going to be planted: seeds, sets, transplants, seed pieces.

- Plant fast growing (cool season) crops like radishes and spinach for early satisfaction. Try to stagger your crops for constant harvest opportunities. Make sure the students will have something to harvest when they return to school in the fall.

Maintaining

Watering

- Watering is extremely important, especially in raised bed gardens. If you are meeting just once a week, you may have to make plans for additional watering. Families, youth groups, organizations, neighbors can sign up for times. Someone will need to be responsible to make sure the watering plans are carried out.

- Using a watering wand is a good way to water the garden. Show how to water at the base of the plant. Teach the kids to count how long it takes to water a plant.
Weeding
- Help the kids distinguish the difference between weeds and garden plants. Show them how to pull weeds so that the garden plants are not disturbed. Tell them where you want them to put the weeds. Have challenges such as finding the biggest weed, most unusual weed, most weeds, etc. Talk about why some parts of the gardens have more weeds than other parts, etc.

Insects and pests
- Insects intrigue and scare children. They enjoy doing the lessons about pests and going on hunting missions to find and eradicate them. Getting to show everyone the squash bug they found – and sometimes their eggs – is a joy in and of itself!
- Use the lessons from Grades 2 and 4 to identify “good guys” and “bad guys” in the garden and to figure out what to do about them. Then help the kids take the next steps to protect their garden from unwanted pests.

Harvesting, Preparing and Eating the Produce!
- Kids get excited when they see fruits/vegetables growing on the plants. Make sure that they show everyone by pointing and not picking! Describe what to look for to determine when the fruits/vegetables are ready to harvest.
- Show kids HOW to harvest produce gently. For example, gently hold a bean plant before pulling off the bean, cut the lettuce with scissors, etc.
- Kids love to harvest and taste the bounty. Try to include this in every lesson.
- Include in the lesson, ideas for how the food can be eaten. Simple recipes such as cucumber-flavored water, radish or veggie sandwiches, veggies with dip, cucumbers and onions in vinegar, etc. are the best. Get a large bottle of Ranch dressing because the kids will try anything they can dip! There are several ideas in the lessons.
- Show the whole vegetable before cutting it open. Have them find the seeds.
- Plastic plates and knives can be used for cutting and preparing produce.
- Help the kids put their gardens to bed.
Sample Gardening Session

1. Meet in gathering area
   a. Remind everyone about behavior expectations.
   b. Chat a bit – What’s up?
   c. Give garden plan for the day
   d. Split into smaller groups if necessary
   e. Have a planned garden activity for each group with an adult supervisor

2. Garden projects
   a. Planting
   b. Weeding
   c. Pest patrol
   d. Watering
   e. Harvesting
   f. Washing
   g. Cutting (if necessary)

3. Snack time
   a. Make their own snacks
   b. If there is nothing to harvest, consider produce from farmer’s markets
   c. Focus on fruits and vegetables
   d. Send ideas home to the families

4. Activity session – see lessons for ideas for games, songs, stories, plays, crafts

5. Go home!
Lesson contents

**GeneraL InformatIon**

Planting Our Food Garden *(Grades K through 4)*

Planting Our Healthy Garden *(Grades 4 and up)*

**Planting is one of the most exciting aspects of gardening. It is the beginning of an adventure and the next step toward producing a crop to harvest. The lessons in this unit will guide youth to implement the garden plans they created during the Planning Our Food/Healthy Gardens lessons. Together, you will look at seeds, sets, transplants, seed pieces, garden tools, tool safety, planting methods, and watering. This Introduction will help you to prepare for a successful gardening experience. Extension Master Gardeners, local foods producers, and avid gardeners would be good partners throughout this unit and can provide their expertise throughout the rest of the gardening season.**

**GARDEN SEEDS AND PLANTS**

Every year you will need to prepare a “shopping list” for the seeds and plants that you are going to need for your garden. The “Garden Plant Shopping List”, found at the end of this Introduction, is a worksheet that will help to determine how much to buy. You may want to work through the columns with the older youth, but it is too complicated for the younger ones.

**Seeds** can be purchased early in the season, weeks before they are actually planted. Seeds should be stored in an airtight plastic container and kept in a cool, dry location until planting time. Although most left over garden seed can be saved until the following season, some may not germinate well if it isn’t stored properly. If you have left over seed, seal the open end of the packet with tape and store it in an airtight container in the refrigerator or location with a consistent temperature, not a garage or storage shed.

At planting time, keep the seeds dry prior to planting. Carefully tear or cut off the top edge of the packet to leave the plant descriptions and planting instructions intact. For ease in planting, you may want to pour your small seeds in a clean and dry recycled shaker such as a spice or cheese container. Be sure to label the shaker and keep the seed packet with the shaker. For slightly larger seeds, you may want to use the pinch cup method. Right before planting, pour the seeds in a labeled 3 to 5 oz. plastic cup so that the students can pinch out a few seeds for planting. Larger seeds can be poured into small labeled plastic containers such as labeled butter tubs. For any of these methods, keep the seed packets near the matching containers so that everyone can read the descriptions and planting instructions. Return extra seeds back to their original packet.

*General Information continued on the next page.*
Some crops, such as tomatoes, peppers, eggplant, broccoli, and cabbage are planted as **transplants** to get a jump start on the growing season. The seeds are planted indoors in small containers or cell packs 5 to 8 weeks before being planted in the garden. For information and activities to grow your own transplants, please refer to the Starting Seeds Indoors activities found in the Apply section of lesson 5B. Be sure that you have the right amount of sunlight, heat, protected space, and time before starting your own transplants.

Before transplants are planted in the garden, set them outside in a shady location for a few days and keep them watered. Gradually move them into the sun. After five to seven days they should be ready to plant in the garden. This is called “hardening off” and prepares the plants for the outdoor environment and reduces the shock associated with transplanting.

When it comes to planting, remind the students that transplants are “baby plants” and should be handled gently and carefully like other babies. Transplants in cell packs can be removed from the packs by pushing up from the bottom. Use care when handling the plants because the plants will not survive if the stems are broken. If tomato transplants are tall and leggy, they can be planted a few inches deeper in the soil. However, most other plants should not be planted more than an inch deeper than what they were growing in the cell pack. Immediately after planting, generously water the soil around the transplants.

Potatoes are planted using **seed pieces** that are actually potatoes that have been grown specifically for planting. You can purchase them at local garden centers early in the spring. Select potatoes that are firm and just beginning to sprout. Avoid those that are soft, show signs of rotting, or have sprouts more than a quarter of an inch long. Do not use potatoes from home that have sprouted.

Cut the potatoes into sections with one or more “eyes” or sprouts on each piece. Each eye, or bud, has the potential to sprout a stem. One potato can be cut into 2 to 4 pieces. The potatoes can be cut into seed pieces the day before planting and stored in a paper bag. Plant them a foot apart, about 4 inches deep with the sprout side up (cut side down).

Onions are often planted as small, dry onion bulbs called **sets**. These are easier for children to handle and plant as compared to the small onion transplants that are sold banded together in bunches. Onion sets are sold in bulk or in mesh bags. Purchase sets that are firm and not yet sprouted. Plant them about 3 or 4 inches apart and about 1 inch deep with the pointed end up.

**TOOLS**

Tools are an important part of gardening. Having the right tools on hand makes the planting more efficient and successful. Lessons 5A and 5B include tool identification, handling, and safety activities. The following tool list is a guide to the types and amounts of tools you may want to acquire for gardening with a group of youth. How many of each tool depends on the number of young gardeners working in the garden at the same time and the size of the garden space. If there are several gardeners, the best way to manage tools and students is to assign different tasks to different groups of students and then switch tasks so everyone can try everything. When multiple groups or classrooms are gardening at the same location, they can alternate the times they are in the gardens so that they can share tools.
GeneraL PLantInG tooLs
(These can be used with all types of gardens.)

Measuring tape: To mark the garden according to the plan

String and stakes: To mark the rows or the sections of the garden

Garden markers or labels: The students should make their own garden markers or labels using suggestions from the lessons such as craft sticks, wooden spoons, laminated note cards, vinyl blind slats, or other creative ideas. However, if you are pre-marking their garden spaces, you may want to use your own garden markers to help the youth and adults figure out where to plant things. Mark each end of a row or corner of a square foot garden space designated for a particular crop. Your markers can be replaced by the youths’ markers and you can use your markers again somewhere else or as back-ups.

Square foot garden templates: These can be made from poster boards using the templates found at the back of each of the lessons. You may want to make two or three of each template for small and medium-size plants. The students can put the template in the appropriate space in the garden, plant seeds in the hole spaces on the template, pick up the template and move it to another space, and start over again. Or, you can make a one or two of each template to place in the garden, sprinkle sand in the hole, move the template and repeat the process. The students can plant the seeds in the spaces marked with sand. Or, you can make several templates out of newspaper that you can leave in the garden as mulch. You will need to fold down the newspaper squares with twigs, garden markers or a thin layer of soil or mulch. The students plant their seeds in poked or cut holes and the newspaper is left to decompose.

Choose a method to plant seeds using the square foot garden templates: Most youth use their fingers. You can use craft sticks, spoons, dibbles, etc.

Seed shakers and pinch cups: See the Seed description in this Introduction.

Rulers or Dibbles: Dibbles are rulers made out of craft sticks. The instructions are found in Lesson 5B. Dibbles can be used to measure the depth of each hole and the distance between plants. They are also good digging tools to plant seeds in loose soil close to the surface.

Watering can: A can that has a spray head that can be removed so that you can use a spout offers the most versatility. Even if a hose is used in the outdoor garden, it is handy to also have at least one watering can that the students can use.

Seeds, transplants, sets, seed pieces: Purchase according to the garden plan and the Garden Plant Shopping List found at the end of this lesson.

Scissors: To cut open the seed packages, to cut the string or twine marking the rows, etc.

Sign(s): You may want to create a sign or signs to tell the public about your garden. Other signs may remind the young gardeners and their families about the rules for the garden. You may also want to consider posting “Do Not Spray” signs near your garden area to remind caretakers and neighbors that you want to protect your garden and gardeners from chemical sprays.
Hand washing stations: You will want to make sure the gardeners have a place to wash and dry their hands.

First Aid Kit: Cleaning supplies, band aids, first aid cream, sun screen, insect repellent, anti-itch cream, and tweezers are handy emergency supplies.

Safety clothing: This is what the students should be wearing to protect them from injury and sunburn. Shoes must cover the entire foot. The right hat can protect your face and neck. Sleeves, pant legs, or sun screen can also protect the skin. Garden gloves are optional. They can protect your hands and keep them cleaner, but they are sometimes awkward and cumbersome.

EARTHBOX OR CONTAINER TOOLS
1. One or two trowels

RAISED BED TOOLS
(Based on one 4’ x 8’ bed)
1. One or two hoes to work the soil before planting
2. One or two rakes to smooth out the soil before planting
3. Two to four trowels
4. Garden hose with a spray wand

TILLED GARDEN TOOLS
(Based on a 10’ x 20’ space)
1. Two to four hoes
2. Two rakes
3. Four trowels
4. Garden hose with a spray wand

It is a good habit to teach and practice tool maintenance after every use. Remove soil residue from trowels, hoe blades, and rakes before putting them away. It will keep the storage area clean and the tools will be ready for the next use. It is best to store tools in an indoor or enclosed location to extend their life and prevent damage such as rusting and weathered handles.

OUTDOOR PLANTING TIME
When can you start planting outdoors? Cool season plants, such as carrots, radishes, onions, peas, lettuce, spinach, and potatoes can be planted as soon as the soil thaws in the spring. Warm season crops can be planted once the threat of frost has passed.

Always be sure your garden soil is ready to be worked before you till or turn the soil over. Do not work the soil when it is too wet - that will result in large clods that are difficult to break apart and rake smooth. To determine if and when the soil is ready to be worked, take a handful and form it into a ball. If it forms a tight ball that doesn’t crumble with a little pressure, it is too wet to work. If it has moisture in it but crumbles apart under slight pressure, it can be tilled or turned over.

At planting time, have everything ready to go – tools, plants, volunteers, water, etc. Detailed instructions for guiding groups of students to plant are found in lessons 5A and 5B.
## Garden Plant Shopping List

**Instructions.** While looking at your garden plan, put an “X” next in the column to the right of all the crops that you will grow in your garden. In Columns 1 or 2, put an “X” to the right of the amount of seeds, sets, transplants or seed pieces according to whether you are planting in rows or square foot sections. In Column 3, figure out the portion of a 10 ft. row or the number of square foot sections you will be using for that particular crop. In Column 4, multiply either Column 1 or 2 times Column 3 and record the amount of seeds, sets, transplants, or seed pieces you will need. You will always need to purchase entire packets of seeds; but this will tell you how many packets to buy according to the total number of ounces needed.

<table>
<thead>
<tr>
<th>CROP</th>
<th>COLUMN 1</th>
<th>COLUMN 2</th>
<th>COLUMN 3</th>
<th>COLUMN 4</th>
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<tbody>
<tr>
<td></td>
<td>Seeds or plants for each 10 ft. row</td>
<td>Seeds or plants for 1 square foot section</td>
<td>Total number of 10 ft. rows or sq. ft. sections</td>
<td>Amount to purchase (COLUMN 1 or 2 x COLUMN 3)</td>
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<tr>
<td>Bush beans</td>
<td>.5 ounce</td>
<td>.25 ounce</td>
<td></td>
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<tr>
<td>Pole beans</td>
<td>1 ounce</td>
<td>.5 ounce</td>
<td></td>
<td></td>
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<tr>
<td>Beets</td>
<td>½ packet</td>
<td>¼ packet</td>
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<tr>
<td>Broccoli</td>
<td>7 plants</td>
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<tr>
<td>Cabbage</td>
<td>7 plants</td>
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<tr>
<td>Carrots</td>
<td>1 packet</td>
<td>½ packet</td>
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<tr>
<td>Cauliflower</td>
<td>7 plants</td>
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<tr>
<td>Sweet corn</td>
<td>1 small packet</td>
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<td>Cucumbers</td>
<td>½ packet</td>
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<td>Eggplant</td>
<td>7 plants</td>
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<tr>
<td>Kale</td>
<td>½ packet</td>
<td>¼ packet</td>
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<td>Kohlrabi</td>
<td>½ packet</td>
<td>¼ packet</td>
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<td>Leaf lettuce</td>
<td>1 packet</td>
<td>½ packet</td>
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<tr>
<td>Muskmelon (cantaloupe)</td>
<td>1 packet</td>
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<tr>
<td>Okra</td>
<td>.25 ounce</td>
<td>.12 ounce</td>
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<tr>
<td>Onion sets or plants</td>
<td>40</td>
<td>16</td>
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<tr>
<td>Peas</td>
<td>1.5 ounce</td>
<td>.75 ounce</td>
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<td>Peppers</td>
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<td>Potatoes</td>
<td>10 pieces</td>
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<td>Sweet potatoes</td>
<td>10 plants</td>
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<tr>
<td>Pumpkins</td>
<td>½ packet</td>
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<td>Radishes</td>
<td>1 packet</td>
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<tr>
<td>Spinach</td>
<td>1 packet</td>
<td>½ packet</td>
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<tr>
<td>Summer squash (zucchini)</td>
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<tr>
<td>Winter squash</td>
<td>½ packet</td>
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<tr>
<td>Tomatoes</td>
<td>4 plants</td>
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<tr>
<td>Watermelon</td>
<td>¼ packet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Horticulturally speaking, plants produce “fruits” but nutritionally speaking, some of those fruits are called “vegetables.” Generally, if the fruit is sweet and you eat it as a dessert or side dish it is still called a fruit. If it is not so sweet and you can eat it as a main dish or side dish, it is called a vegetable. For example, tomatoes, cucumbers, peppers, and peas are the fruit of the plant, but we eat them as vegetables.**
### CONTENT OBJECTIVES
Plant a garden using “Our Food Garden Plan” from Lesson 4A and the most appropriate planting methods according to the type of garden and the plants that have been chosen for the garden. Experience personal health benefits of going outside, physical activities, water, and eating foods grows in gardens.

### LIFE SKILL OBJECTIVES
Critical thinking, Decision making, Healthy Living, Citizenship, Leadership, Communication

### INDICATORS & EVALUATIONS
Students will successfully plant the garden according to the plans and planting methods from these lessons; Create a seed to seed cycle model; Exercise in the garden, use water, and eat foods grown in a garden

### 21st Century Skills:
Employability skills, Health literacy

### SUBJECT STANDARDS

**Science:** Science as inquiry, Earth and space, Life science

**Mathematics:** Operations and algebraic thinking, Numbers and operations, Measurement and data, Geometry, Mathematical practices

**Social Studies:** Behavioral sciences, Geography

**Literacy:** Reading, Speaking, Listening, Viewing

### CORE CONCEPTS AND SKILLS
Linguistic-words, Logical-mathematical, Spatial-visual, Bodily-kinesthetic, Interpersonal, Intrapersonal, Natural

### LEARNER TYPES
Seed to Seed Cycle activity in the Introduction:

- Sunflower Life Cycle *(one copy per student, found in the Introduction section)*
- Scissors, glue, tape, brown crayon, or marker *(enough for everyone to share)*
- Small yellow paper plates *(one per student)*
- Paint stir sticks *(one per student)*
- Sunflower seeds *(Could be sunflower seed snacks or birdfood, at least six seeds per student.)*
- Brown crayon or marker *(enough for everyone to share)*
- Green dessert napkins *(Cut along the fold line so two students can use a napkin. You may want to substitute green construction paper and cut out the leaves.)*
- Sunflower head pictures or an actual sample *(optional)*

Start Your Own Transplants activity in the Do section:

- Strips of black and white newspaper *(approximately 4" x 11")*
- 3 or 4 empty, clean frozen juice cans
- You may substitute peat pots for the strips of newspaper and juice cans.
- Fresh potting soil

*Materials continued on the next page.*
**MATERIALS CONTINUED**

Start Your Own Transplants activity in the Do section, continued:
- Garden seeds or mammoth sunflower seeds
- Garden flats or trays
- Large, clear plastic dry cleaner’s bag (optional)
- Small watering can or pitcher
- Potato *(for the Do section seed pieces discussion)*

*Our Food Garden Plan* *(Students’ garden plan from Lesson 4A)*

- Garden Matching Game cards (copy and cut out one or more sets of the cards according to the number of students playing the game, see the Do section, found at the end of this lesson)
- Seeds and seed packets, sets, transplants, seed pieces *(Please refer to the students’ Our Food Garden Plan from Unit 4, Lesson 4A and Unit 5, How do you plant a garden? General Information section and this lesson to determine what you will need.)*
- Garden tools *(Refer to the Unit 5, How do you plant a garden? General Information section and the Reflect and Apply sections of this lesson to determine what you will need.)*
- Container, raised bed, or tilled garden
- Square-foot garden templates *(found at the end of this lesson)*
- Bottle of water *(one per student)*
- Healthy snack *(such as apples, berries, or vegetables with or without dip)*
- Garden Journal page *(copy one per student or display one for the group, found at the end of this lesson)*

**TEACHER’S NOTES:** You may want to do the Introduction, Do, Reflect, and Apply sections on different days. The Seed to Seed Cycle activity in the Introduction and the Start Your Own Transplants optional activity in the Do section could be done a few weeks before planting.

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**INTRODUCTION**

**ENGAGE**

**SET THE STAGE**

**15 MINUTES**

*(25 MINUTES IF COMBINED WITH THE START YOUR OWN TRANSPLANTS ACTIVITY FROM THE DO SECTION, THIS SECTION COULD BE ONE DAY AND THE OTHER SECTIONS ANOTHER DAY)*

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**SUNFLOWER SEED TO SEED CYCLE**

Distribute one set of the Seed to Seed Cycle supplies as described in the Materials list for this lesson.

*Hold up a yellow paper plate.*

What shape is this?

Circle

What other things are circles?

Wheels, hoops, plates, pancakes, etc.

--

Wheels are circles that go around and around.

What is it called when a wheel or circle makes one complete rotation?

It is a cycle. You probably have a bicycle. “Bi” means two. “Cycle” means it goes around and around in complete circles. Bicycles have two circular wheels that go around and around to move you across the ground.

When something goes through a full cycle, where does it end?

Technically, a cycle never ends unless something stops it. In the case of a seed, a butterfly, or a food cycle, a cycle ends where it started and then it has the ability to start over again. We are going to make a sunflower seed to seed life cycle to show how one sunflower seed starts a cycle by producing a plant and ends by producing more seeds that can grow into more plants.
INSTRUCTIONS TO MAKE A SUNFLOWER SEED TO SEED CYCLE MODEL

1. Cut around the circular edge of the Sunflower Seed to Seed Cycle and glue it to the inside of the paper plate.

   What is the picture at Step 1 of the Seed to Seed Cycle?
   It is a seed.

   What do you do with the seed to start the cycle?
   Plant it in the ground and water it.

2. Glue one sunflower seed to the bottom of the paint stir stick as if you were planting the seed in the ground and the stick was the stem that grew from the seed.

   When the seed is watered, what is the next step in the Seed to Seed Cycle?
   Hint: Take a look at Step 2 on the picture.
   The seed germinates or sprouts. The roots start first and then the leaves and stem grow up out of the ground.

3. Use a brown marker or crayon to draw roots growing out of the seed on the paint stick.
   The paint stick becomes the stem that grows out of the ground.

   While the small sprout or sunflower plant continues to be fed by the sun, soil, water and air, take a look at Step 3 and tell us what it does next.
   The stem and leaves continue to grow. You may begin to see a bud for the flower.
4. Take the green napkin and pinch it together in the middle to form two green leaves. Put tape across the pinched part of your leaves and tape them to the back of your stem or stir stick. **Take a look at Step 4 of the cycle and describe what happens after a sunflower grows a little taller?**

Flowers start to grow on the sunflower plants. Some sunflower varieties have several flowers on one plant, others have just one large flower.

5. Make petals around the paper plate, or sunflower blossom, by coloring the edges and then cutting slits from the outer edge of the plate to the Seed to Seed Cycle picture. You may want to bend some of the petals to make it look more like a real flower. Then put a strip of tape across the back of the paint stick to hold the flower in place. You may choose to glue the flower onto the stick. Look at your bright, colorful sunflowers. This is usually the favorite step or stage of growing a sunflower.

**What happens when the sunflower begins to fade?**

When flowers fade on plants, fruits form. The dried-up flower head is the fruit of a sunflower. It is represented in Step 5 of the Seed to Seed Cycle.

**After the sunflower head dries, what is forming in the middle of the flower or fruit?**

Sunflower seeds

**Why is Step 6 written next to Step 1 of the Seed to Seed Cycle?**

The sunflower plant has produced more seeds like the ones in the picture to start the Seed to Seed Cycle over again.

6. Glue several sunflower seeds in the middle of the Seed to Seed Cycle picture. You will see several rows of sunflower seeds in the center of a real sunflower. You may want to show a picture or have a real sunflower head for the students to examine.

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**SEED TO SEED CYCLE REVIEW**

We have gone through one complete seed to seed cycle of a sunflower.

**How many steps are there in the sunflower seed to seed cycle?**

Six

The sunflower seed to seed cycle also can be called a sunflower life cycle.

**How can the seed to seed cycle be the same as a life cycle?**

When a sunflower seed is planted and watered, it starts a sunflower sprout or small plant. The sprout needs sun, soil, water, and air to grow and become a healthy larger plant. Then a flower grows on the plant. The flower produces the fruit that contains many seeds. The plant dies, but the seeds from the plant can produce new sunflower plants with more seeds.

Let’s say the steps together:

- **STOMP foot, CHANT “seed,” and CLAP at the same time**
- **STOMP foot, CHANT “sprout,” and CLAP at the same time**
- **STOMP foot, CHANT “grow,” and CLAP at the same time**
- **STOMP foot, CHANT “flower,” and CLAP and the same time**
- **STOMP foot, CHANT “fruit,” and CLAP at the same time**
- **STOMP foot, CHANT “seed,” and CLAP at the same time**
How many seeds did it take to grow one sunflower?
One

How many seeds did one sunflower seed produce?
Sunflowers produce hundred of seeds per plant. Each seed actually starts out as a little flower. The seeds grow in spiral rows creating amazing patterns. Good mathematicians can do Fibonacci Math and figure out the number of sunflower seeds by the number of spirals. (You may want to find a picture, look up “sunflowers” on Wikipedia, or show an actual sunflower head.)

How is the sunflower life cycle or seed to seed cycle similar to the plants that we are about to plant in our garden?
Have the students describe the seed to seed cycle of a few of the crops they will be planting.

Do you think our garden plants will produce as many seeds as you can find in one sunflower?
Start a discussion about the kinds of plants you will be growing in your garden and make predictions. Record the predictions in a garden journal or on a chart.

Let’s get the seed to seed cycle going in our garden.

TEACHER’S NOTE: Hopefully you have read and utilized the charts in the general information for this planting unit and have obtained the seeds, sets, seed pieces, and transplants to carry out the Our Food Garden Plan from Unit 4, Lesson 4A. If you aren’t planting potatoes, it will help in the seed pieces discussion to have one to show the students. Also, copy and cut out the Garden Matching Game cards found at the end of this lesson. If you are working with many students, you may want to make more than one set and have two or three groups playing the game. As a hands-on activity option a few weeks before planting your garden, you may want to do the optional Start Your Own Transplants activity found at the end of this section.

What do we need to plant our garden?
We will need the garden space filled with good soil, seeds to start the plants, tools to help us, and sun, soil, water, and air so the plants can grow.

We just discovered that plants start as seeds, but some plants grow better in our garden if we start them in another way.

SEEDS, SETS, SEED PIECES, AND TRANSPLANTS
Show the seeds, sets, seed pieces and transplants that you will be planting in your garden. If you aren’t ready to plant everything yet, the Garden Matching Game will help the students understand how they will be planting future crops. Here are some tips for discussing each planting strategy.

We can start with seeds when we have enough time to grow them and the plants are easy to grow from seeds. (Show the packets and have the students identify the plant, look at the seeds, and read the information on the back of the packet. You may want to record the information in a garden journal.)
A transplant is a small plant that is started from a seed and grown until it is ready to be moved or transplanted into another container or the garden. Transplants can be grown at greenhouses or we can start them a few weeks before we are ready to garden. They need the right amount of light, water, temperature, humidity, and soil conditions in order to grow into a sturdy plant that can be transplanted. (Show the transplants that will be planted in the garden. Have the students identify the plant and read the label in the container. You may want to record the information on a garden journal. If you are planting some seeds in containers that will be grown in your classroom and transplanted to your garden, finish the other two planting strategies and then proceed to the optional Start Your Own Transplants activity at the end of this section.)

Some plants, such as onions, can be planted using an onion set. Sets are small bulbs that were started from seeds the year before. Sets are a part of a plant. Onions can also be planted as little plants that are sold in bundles. (Show a set.)

Potatoes are planted from pieces of a cut-up potato called a seed piece. Each piece has a bud on it that will grow. (If possible, show a potato that is starting to sprout. Point out the eyes or sprouts and cut the potato into pieces. Each piece should have a sprout.) A potato is actually a swollen, fat underground stem. Each one of the sprouts on the potato is like a bud that will grow into a shoot that grows up and above the ground.

**GARDEN MATCHING GAME INSTRUCTIONS**

Divide the group into Team One and Team Two and make a tally chart where everyone can see. In larger groups of more than 18 students, divide the group into four teams and play two games at once. Give half the Team One Garden Matching Game cards with the garden produce pictures to Team One. Give all the Team Two Garden Matching Game cards with the seeds, sets, seed pieces, and transplant pictures to Team Two.

Team One starts the game by choosing and holding up one of the garden produce pictures for Team Two to see. Team One asks Team Two the following question:

**How should we plant this ____________________?**

*(Fill in the blank with the name of the garden produce in the picture.)*

Team Two discusses their responses, chooses the correct picture and holds it up for Team One to see. Team Two gives the following response to Team One’s question:

**We should plant the ____________________ using ____________________.**

*(Fill in the first blank with the name of the garden produce and the second blank with the planting method.)*

Use the answer key below to determine the best response. If the answer is not correct, do not share the correct response; instead, give Team One and opportunity to give a response. The team with the correct response gets one point. After Team One is done presenting their half of the garden produce pictures, take the planting method pictures from Team Two and give them to Team One. Give the rest of the garden produce pictures to Team Two and proceed with the game.
START YOUR OWN TRANSPLANTS OPTIONAL ACTIVITY

1. Wrap a strip of newspaper around a juice can with about 1½ inches hanging over the bottom of the can. Fold the excess paper up around the bottom of the can to form the bottom of the pot. Press it down on the tabletop to secure. Remove the juice can. Fold over the top of the pot ½ inch to the inside to hold the pot together and form a rim.

2. Fill the paper pots with potting soil.

3. Use your finger to make a hole in the center of the pot according to the planting depth instructions on the seed packet. Plant the seed or a few tiny seeds. Cover the seed(s) with soil.


5. Place pots close together on the tray or flat.

6. Cover with large, clear plastic bag.

7. Set in a location that receives bright, indirect light.

8. When the seeds start to germinate, remove the plastic bag.

9. Set the plants where they will receive full sunlight.
   (If you feel the paper pots are too difficult to make, you may want to substitute peat pots.)

10. When the plants are at least 2 inches tall, you can plant the entire pot in the soil outside. Be sure that the paper is all underground so that it doesn’t act as a wick to take the water away from the plant. The paper will decompose into the soil.

ANSWER KEY

<table>
<thead>
<tr>
<th>Seed</th>
<th>Seed piece</th>
<th>Transplant</th>
<th>Sets (occasionally small green transplants)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumpkin</td>
<td>Onion</td>
<td>Tomato</td>
<td>Pepper</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Cabbage</td>
<td>Spinach</td>
<td>Carrots</td>
</tr>
<tr>
<td>Lettuce</td>
<td>Beets</td>
<td>Snap bean</td>
<td>Corn</td>
</tr>
<tr>
<td>Beets</td>
<td>Spinach</td>
<td>Carrots</td>
<td>Pea</td>
</tr>
<tr>
<td>Peas</td>
<td>Potato</td>
<td>Cucumber</td>
<td>Radish</td>
</tr>
<tr>
<td>Squash</td>
<td>Potato</td>
<td>Cucumber</td>
<td>Radish</td>
</tr>
<tr>
<td>Sweet potato</td>
<td>Seed</td>
<td>Seed</td>
<td>Seed</td>
</tr>
<tr>
<td>Transplants</td>
<td>Seed</td>
<td>Seed</td>
<td>Seed</td>
</tr>
</tbody>
</table>

ANSWER KEY

- Pumpkin Seed
- Onion Sets (occasionally small green transplants)
- Tomato Transplant
- Pepper Transplant
- Lettuce Seed
- Broccoli Transplant
- Cabbage Transplant
- Spinach Seed
- Carrots Seed
- Beets Seed
- Snap bean Seed
- Corn Seed
- Pea Seed
- Potato Seed piece
- Cucumber Seed
- Radish Seed
- Squash Seed
- Sweet potato Transplants
TEACHER’S NOTES: The supplies for this section are determined by the types of garden and planting methods you are choosing. Please use the Unit 5, How do you plant a garden?, General Information section as a guide. If you are using the square foot gardening method, make two templates for each plant size for the students to share. Make one seed shaker for each type of tiny seeds you will be planting and one pinch cup for each small to medium seed you will be planting. Make sure you label the containers. You will need the tools, garden label and dibble supplies to complete this section.

What are we planting and are we using seeds, sets, seed pieces or transplants to plant it?
Review the crops you are planting and the ways you are planting each crop.

What type of a garden space will we use to plant our crops – a container, raised bed or a traditional in-the-ground (tilled) garden?
Review the type of garden they planned from Lesson 4A, Planning Our Food Garden.

GARDEN TOOLS
The type of garden space we are using and the way we are planting our crops determines which kind of garden tools we will be using to plant the garden. We need to make sure we have our tools ready and that we know how to use them safely and effectively.

Display the Garden Tools Checklist, found at the end of this lesson, so that everyone can see it. Identify the tools that you will be using, show them the actual tool, and make a checkmark in the appropriate column for each tool. Use the Tool Safety Game to complete the “Know how to use” column.

What tools do we need to make or get?
Use the checklist to respond to the question.

GARDEN LABELS
The students can make garden labels for each crop and each row or square foot section where it will be planted. You may want more than one label for each row or section. Have fun and be creative with the labels. Use materials that can withstand the weather, soil conditions and watering. Options may include craft sticks, wooden spoons, plastic spoons, garden stakes, vinyl window blinds cut into garden stakes, laminated card stock or seed packets stapled to a stake, small hanging clay pots, etc. Use permanent markers or put a protective spray over the label. Do a search on the Internet for other ideas.

DIBBLES
More than 100 years ago, gardeners used dibbles or dibbers to poke the right-size hole in the garden, drop the seed, and cover the hole. It made planting easier and seeds planted at the right depth have a better chance of growing.

Line your craft stick up with the zero inch mark at the start of your ruler. Find ¼ inch on your ruler and make a little line from ¼” on your ruler onto about a fourth of your craft stick. Do the same at ½”, ¾”, 1”, 1½”, 2”, 3”, 4”, 5”. Then move your rulers to the other side of the stick and do the same thing. In between your two lines, mark the measurements using the number and the inch symbol.
I am going to show you some right and wrong ways to use and store our tools. If you think I’m showing you the right way, clap. If you think I’m showing you the wrong way, stomp your foot.

- **Lift the hoe so that the blade is over your head like you are swinging a hatchet.**
  
  *STOMP.*
  
  I have lifted the hoe too high. I am not chopping the soil. I am hoeing it. It doesn’t work very well this way. Also, you may hit someone who is nearby if you swing the hoe this high in the air.

- **Lift the hoe so that it is about 1 foot off the ground and bring it down in a gliding motion through the surface of the soil.**
  
  *CLAP.*
  
  This is the correct way to use the hoe to cut through crusty soil and remove weeds.

- **Repeat the same motions with the rake.**

- **Lay the rake down, teeth up.**
  
  *STOMP.*
  
  You should never set a rake or a hoe on the ground like this. What do you think would happen? The teeth of the rake or blade of the hoe may go into your foot and the handle could pop up and smack you in the face. *(You may want to carefully demonstrate how the handle pops up.)*

- **Stand the rake and hoe, handles up, against a wall or hang them.**
  
  *CLAP.*
  
  Rakes and hoes should be stood against a wall or in the shed or garage when they are not being used.

- **Walk with the trowel blade up.**
  
  *STOMP.*
  
  Always carry your tools such as this trowel with the sharp blade facing down.

- **Run a short distance holding a hoe and a trowel.**
  
  *STOMP.*
  
  Never run with tools in your hands.

- **Pretend to wash dirt from the trowel, hoe, or shovel.**
  
  *CLAP.*
  
  It is always a good idea to clean the soil off your tools before you put them away. This shows you are responsible for taking care of your tools.

- **Pretend to fight with a student over a trowel or hoe.**
  
  *STOMP.*
  
  Show respect by taking turns.
Write your name on the back of your new dibble and store it where you can find it when we are ready to plant our gardens.

Katie Jones

SQUARE-FOOT GARDENING

Use poster board to make square-foot gardening templates from the patterns found at the end of this lesson. Label the templates according to the crops listed on the pattern. Or, make them with newspaper that can be staked down with small sticks and left to become decomposing mulch in the garden.

These are square-foot gardening templates. We will use them to plant (name of crops). You will put them on the soil, figure out how deep to plant the seed, use your dibble or finger to poke a hole in the center of each circle, plant your seed, and cover it up.
**TEACHER’S NOTES:** Master Gardeners or gardening volunteers can prepare the garden ahead of time by measuring and marking it out with string or stakes according to the students’ plan from Lesson 4A, Planning Our Food Garden. The students will be applying what they just learned as they actually plant their container, raised bed or tilled garden. All the supplies should be ready to go and placed near the garden. You may want to make a Garden Rules sign to display near the garden and to review each time before working in the garden. The snack after gardening includes water and a healthy snack, such as apples, berries, or fresh cut vegetables and dip.

**GARDEN RULES**

Establish the ground rules for the garden. You may want to write these on a re-usable poster board that can be creatively posted every time the class goes to the garden. Have the students repeat the three R’s – Respect, Responsibility, Readiness and give examples of how each of them applies to the garden.

**RESPECT**

**Yourself** – Wear shoes that cover your entire foot, clothes that protect your skin from the sun and from being too cold or too hot, and practice safety.

**Your gifts** – Share your energy, and use your skills and knowledge to help others.

**Other people** – Be a good listener, consider others’ ideas, share tools, say please and thank you, ask questions rather than assuming things, do not get into each other’s spaces, and practice safety.

**Other people’s things** – Do not touch or borrow things without asking, keep things clean and undamaged, and practice safety.

**The environment** – Take good care of the garden and the space around it and remind others to do the same.

**RESPONSIBILITY**

Be on time and stay where you are suppose to be.

Listen and follow instructions.

Use garden tools and supplies safely, clean them, and put them away correctly.

Share in the work and the fun of the garden. (Remember what happened in the Little Red Hen?)

**READINESS**

Be ready to listen, learn, have fun, work hard, share, and most of all grow healthy food!

*Establish a “Gardeners Go” cue with a clap or noise to indicate that gardeners can start their tasks and a “Gardeners Stop” cue with two claps or a noise to indicate when gardeners should stop what they are doing and look at you for more directions. Have students practice going and stopping while they pretend to be hoeing or digging with trowels. Explain that this will make it easier to work with so many people in the garden, it will give everyone a chance to garden, and it will help to get the garden chores done in a limited amount of time.*
PLANTING

CONTAINER GARDENS

1. If the container(s) will be movable after planting, put it (them), the soil mix, gardening tools, and what you are planting in the center of newspapers or plastic, such as large outdoor garbage bags, leaving enough space for the students to sit or stand around the edges. Otherwise, have the students gather around the container(s) in the location where the container(s) will remain. Be sure that the container gardens will have plenty of light, water, and air circulation for the plants to grow.

2. The container(s) should be sturdy and clean, have enough room for all parts of the plants to grow, and have a good drainage system. Have the students stand back as you follow the directions to assemble any container kits such as EarthBox™. Then give them an opportunity to mix up the soil, level it off, and measure it to see if it is close to 1 inch from the top of the container.

3. Depending on the size and shape of the container you can plant many kinds of plants in one container using the square foot gardening method, rows, or other arrangements that allow space for the plants to grow. You can also start plants in a container and move them to a raised bed or tilled garden. Work with the students to decide where and how they will plant things using the seeds, sets, seed pieces, or transplants from the Do section and the tools from the Reflect section of this lesson.

4. Read or have the students read the planting depth and spacing information on the seed packets or plant labels. Have the students take turns to come to the container in pairs. They can work together to make a hole with their fingers, dibbles, or trowel; plant the seeds from the seed shaker or pinch cup or they can plant sets, seed pieces or transplants; and put the dirt back over the seeds. Make sure to use the garden markers to show what seeds are planted and where.

5. Move the container to the spot where it will stay most of the time. Using a small watering can or another container of water, gently water the entire surface of the container garden. Be careful not to wash out the tiny seeds planted just under the surface of the soil. If the kit has another type of watering system, follow the directions provided.

6. Have all the students thoroughly wash and dry their hands.

RAISED BED AND TILLED GARDENS

1. The garden should be measured and marked according to the students’ garden plan from Unit 4, Lesson 4A, Planning Our Food Garden. The seeds, sets, seed pieces, and transplants from the Do section and the tools from the Reflect section should be placed near the garden. You may want to display the Garden Rules sign as a reminder near the garden.

2. If you are working with raised bed gardens, have half of the students stand on one side of the garden and the other half stand on the opposite side of the garden. If the gardens are too big to have the students stand along the sides of the garden and still be able to hear, stand in a group near the garden and gardening supplies.
3. Use the students’ garden plan from Lesson 4A and the marked garden to help the students discover where the crops will be planted in the garden. Then start at one end of the garden, identify the plants that will be grown there, read the planting depth and spacing information on the seed packets or plant labels, and demonstrate how to plant the crop.

If you are using square foot gardening templates, place a template in the designated space; use your finger or a dibble to make a hole in the center of one of the template circles; plant seeds using the seed shaker or pinch cup or plant the sets with the roots going down and the shoots going up; and put the dirt back over the seeds or sets. Show how to flip the template over to plant the next square foot section of the garden. Make sure to use the garden markers to show what seeds are planted and where.

If you are planting in rows, show how the row is marked by a string stretched across the garden. Use the edge of a hoe to make a shallow furrow along the string or use a dibble to make shallow holes following the string line. Use the shaker or pinch cups to plant the seeds. Plant the sets with the roots going down and the shoots going up. Cover the seeds or sets with soil. For transplants or seed pieces, demonstrate how to use a trowel or shovel to dig a hole, use the dibble or another measuring tool to check the depth of the hole. Drop one or two seed pieces in the hole or show how to carefully remove the transplant from the container. Loosen the soil around the roots before placing it in the hole. Cover the seed pieces with soil or fill in the hole around the transplant with the soil.

4. After demonstrating all the planting methods, the students can work in pairs to plant the section of the garden closest to them or you can work together to plant everything. One student can make the hole while another student plants the seeds, sets, seed pieces, or transplants. This is when several dibbles come in handy. Make sure the garden labels are placed with the matching crops in the garden.

5. Use watering cans or a hose with a water breaker attached to gently water the gardens. Be careful not to wash out the seeds. Make a plan for the students to take turns watering.

6. Have all the students thoroughly wash and dry their hands.

WE NEED WATER AND ENERGY, TOO!

What do we need that we just gave to the plants?
People, plants, and animals all need water in order to survive. Everything in our body needs water in order to work as it should. Water also cleanses our bodies.

Distribute water bottles to the new gardeners.

Like people, plants need energy to grow and be healthy. Plants get their energy from the sun, water, and carbon dioxide that are mixed together in the leaves to make plant food. Sometimes we add special soil nutrients or fertilizer to the soil to help plants grow. We are simply going to eat a snack to get energy.
Distribute the snacks and discuss them with the students.

Could some of the ingredients in the snack be grown in a garden like ours?

Could some of the ingredients in the snack be grown in the state where we live?

Does the package tell you where the snack is made or where the ingredients come from?

**GARDEN JOURNAL PAGE**

Remember, if you plant something new or harvest anything from your garden, please record it on your Garden Journal page. If you haven’t started this page, please copy and use the Garden Journal page found at the end of this lesson.
## Garden Tools Checklist

<table>
<thead>
<tr>
<th>Tools</th>
<th>Garden Tool Use</th>
<th>We will use</th>
<th>Need to make or get</th>
<th>Know how to use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Gloves protect hands and keep them clean.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rake</td>
<td>The short, stiff teeth on a garden rake are strong so that it can break up clods and make the soil smooth for seeds and plants.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fork</td>
<td>A garden fork loosens the soil and turns it over. It also can be used to harvest underground crops such as carrots and potatoes.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pinch cup and seed shaker</td>
<td>Use a seed shaker made from spice containers to shake a few tiny seeds into a hole. Use a pinch cup to pinch out small to medium-size seeds and release the seed(s) in the hole.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trowel</td>
<td>A trowel looks like a small shovel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shovel</td>
<td>A shovel is used to dig larger holes for planting larger things in the garden and landscape, like trees and shrubs. It also can be used to turn soil over. Gardeners use shovels to add things, such as compost and manure, to their garden.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dibble</td>
<td>Make a dibble from a craft stick. Use a dibble to dig shallow holes and to measure the depth of holes for seeds, sets, seed pieces, or transplants.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### GARDEN TOOLS CHECKLIST CONTINUED

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<thead>
<tr>
<th>Tools</th>
<th>Garden Tool Use</th>
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<tbody>
<tr>
<td>Tape measure</td>
<td>A tape measure that is long enough to stretch the length of the garden is important to have when it comes to determining where crops should be planted and giving them enough room to grow.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labels</td>
<td>Garden labels or markers are important to identify the crops and know where everything is planted. Using the tape measure and your garden plan, the labels can be put in just before the garden is planted.</td>
<td></td>
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</tr>
<tr>
<td>Watering can</td>
<td>A watering can holds one to two gallons of water and has a spout that allows you to gently water plants by hand. It is ideal for small gardens, but not very efficient for large, tilled gardens.</td>
<td></td>
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</tr>
<tr>
<td>Hose</td>
<td>A hose is used to take water from the water spigot to the garden. Several hoses can be connected so that the garden can be watered a fairly long distance from its source.</td>
<td></td>
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</tr>
<tr>
<td>Water breaker</td>
<td>A water breaker is typically attached to the end of a hose to “break up” the flow of water into a spray or forceful spray. On the “shower” setting, it wets the soil gently without washing the soil away from the roots or damaging the plants.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>String</td>
<td>A string is used to stretch from a stake on one side of the garden to one on the other side. It is used as a guide to keep seeded and transplanted crops in a tidy straight row.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Square foot template</td>
<td>Place a square foot gardening template where you want to plant a crop. Use your finger or a dibber in the center of each hole and plant a seed. Square foot gardening is easy to do and maximizes the use of garden space.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SQUARE-FOOT GARDENING TEMPLATE**

1. Make a copy of this page.
2. Cut around the squares and cut out the circles.
3. Place one template on one corner of a poster board.
   - Draw around the outside of the square and around the circles.
4. Use the same template four times to make a square foot gardening guide.
5. Cut around the square foot and cut out the circles.
6. Write the names of the crops in the center of the guide.
7. You may want to laminate your templates to keep from year to year.
My Garden Journal

Date:

What I planted:

What I did:

What I picked:

What I ate from the garden:

What I learned:
GARDEN CHALLENGE

TEAM 1

potatoes

TEAM 1
tomato

TEAM 1

peas

TEAM 1

onion

TEAM 1

carrots

TEAM 1

lettuce
**GARDEN CHALLENGE**

**Team 1**  
- pumpkin

**Team 1**  
- pepper

**Team 1**  
- broccoli

**Team 1**  
- cabbage

**Team 1**  
- spinach

**Team 1**  
- beets
GARDEN CHALLENGE

TEAM 1  green beans   TEAM 1  corn

TEAM 1  cucumber   TEAM 1  radish

TEAM 1  squash   TEAM 1  sweet potatoes
### GARDEN CHALLENGE

<table>
<thead>
<tr>
<th>TEAM 2</th>
<th>seed pieces</th>
<th>TEAM 2</th>
<th>sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEAM 2</td>
<td>transplants</td>
<td>TEAM 2</td>
<td>seeds</td>
</tr>
</tbody>
</table>
**GARDEN CHALLENGE**

*Team 3* shallow

*Team 3* medium

(¼" deep)

*Team 3* not seed

transplant, set, seed piece

*Team 3* deep

(½" to 1" deep)