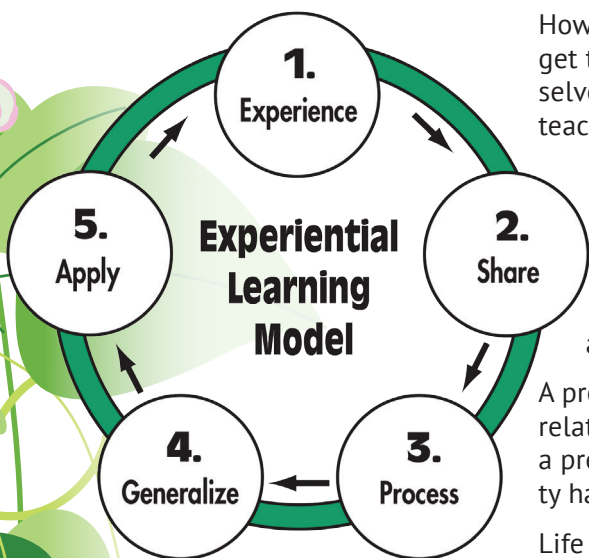




Note To The Project Helper



Pfeiffer, J.W., & Jones, J.E., "Reference Guide to Handbooks and Annuals"
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How wonderful that you've agreed to be a project helper to help youth get the most out of learning about vegetable gardens and about themselves. Whether you are a family member, project leader, junior leader, teacher or neighbor, your help is greatly appreciated!

Each of the 12 activities in Level B, Let's Get Growing, is designed to give the young person an opportunity to learn by doing. Then the youth reflect on what happened, what they learned, and how they can generalize and apply it to everyday life. This is called the **experiential learning process**, and it distinguishes 4-H from most schools and other formal education programs.

A project skill and a life skill are listed for each activity. The project skill relates to the vegetable gardening subject matter. The life skill relates to a process that the member undergoes when doing the activity. The activity has been designed to teach both these skills.

Life skills are grouped into three categories. This Level B manual follows Level A, See Them Sprout, in focusing on competency and coping life skills. Level C, Take Your Pick, introduces contributing life skills, while Level D, Growing Profits, focuses on them in greater depth.

Acknowledgements

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Life Skills Learning through 4-H

Competency

Acquiring knowledge
Using scientific methods
Mastering technology
Making career decisions
Managing resources
Communicating

Coping

Recognizing self-worth
Relating to others
Making decisions
Solving problems
Dealing with change

Contributing

Applying leadership skills
Taking community action
Volunteering
Conserving the environment

To encourage and challenge members, you can:

- Guide the member in thinking through why something happened or didn't happen
- Listen
- Be a resource person for understanding the subject matter
- Provide additional information to challenge the member

A project leader/helper's guide for the four youth manuals is available online for download. It contains a content overview, activities list by manual, background information not found in the members' manuals, and additional suggestions for group activities. The Solutions section of the project leader/helper's guide answers some of the the questions posed in the "Grow What You Know," "What's It All About?" and "Dig Deeper" sections of the 4-H members' manuals.

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In Level B, Let's Get Growing, you will:

- Complete the activities in year 1 or year 2, depending on your level.
- Complete the record sheet for year 1 or year 2 at the back of this manual.

For exhibit options, see your county handbook/Fair Book.

Plant a Transplant

Using transplants

In this year's garden, you can use plants that you set directly into the garden when the time is right instead of starting the entire garden with seeds.

Many gardeners like to get a head start by setting out small plants when it's warm enough, instead of starting with seeds. These plants are called transplants because they are moved from where they originally sprouted.

Why do some plants need a head start? Some vegetables do not ripen or mature quickly because they require a long growing season or cool weather for the best growth.

Although radishes, carrots, beans, and sweet corn sprout quickly from seed, use transplants to produce vegetables earlier in the growing season for these vegetables:

- Tomatoes
- Cauliflower
- Broccoli
- Eggplant
- Cabbage
- Pepper

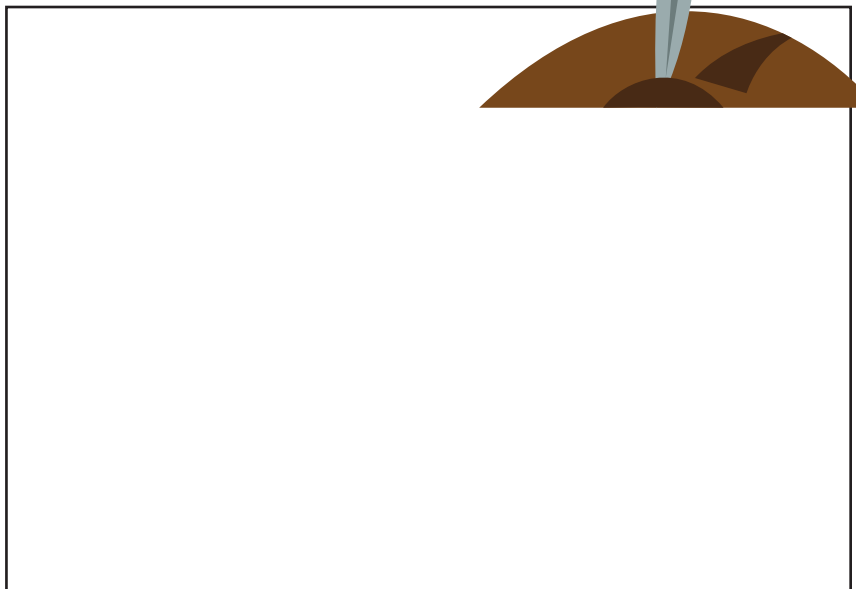
You can get a head start by having small plants ready to set out in the garden when it's warm enough in two ways:

- Plant seeds indoors, and let them grow until they are large enough to be transplanted into your garden.
- Buy small plants at a local garden center.

Supplies: pencil

Before you do this activity, read the suggestions in "Grow What You Know." Talk with other gardeners about the transplants they found to be most practical. Also refer back to The Second-Year Garden in Level A, which discusses cool-season vegetables.

1. Draw your plan for this year's garden in the space below or on the graph paper provided for you on page 39.



Size of my plot (length and width in feet) or container _____

Location of my garden _____

Direction the garden rows or containers face _____

Type of soil in my garden plot or container _____

Vegetables I plan to plant:

By seed directly in the garden _____

By purchasing transplants _____

Where I plan to purchase seeds or transplants _____

Number of packets (or ounces) of seeds I need to buy _____ Cost _____

Number of transplants I need to buy _____ Cost _____

After reading Grow What You Know, look at the chart below. For each plant family, list vegetables that belong to that family and a characteristic they have in common. Ask people you know, especially gardeners and vegetables growers in your area. You can also look in books or online, or ask at a greenhouse or garden center. The first one is done for you.

Family name	Common crops	Characteristic
Cruciferae	Broccoli, Brussels sprouts, cabbage, kale, cauliflower, radishes, turnips, kohlrabi, etc.	Cool-season vegetables
Cucurbitaceae		
Leguminosae		
Liliaceae		
Solanaceae		
Umbelliferae		

GROW WHAT YOU KNOW

VEGGIES HAVE FAMILIES, TOO

Vegetables are botanically classified into families. That means some of your garden vegetables are cousins! As in human families, members of a plant family are alike in some ways and different in others.

Vegetables in the same family often:

- Need the same growing conditions.
- Are planted at the same time.
- Need the same plant food.
- Are bothered by the same insects and diseases.

Getting to know vegetables by their family is a bonus, because plants affect soil and soil affects plants in different ways. For example:

- Some growing plants use more nutrients in the soil than others.
- A disease such as a fungus, or certain insects like corn rootworms, can last through the winter (over-winter) in the garden. They can cause bigger problems the next year if a vegetable in the same family as the infected one is planted in the same place.

Avoid problems with your soil's nutrients and possible diseases by not planting the same vegetables—or plants that are in the same family—in the same place in the garden each year. Instead, rotate (change) the place where your vegetables grow each year. (See the illustration on page 6.)

DIG DEEPER

Make a plan to rotate your garden for next year based on what you learned about plant families.

Many plants in the legume family have a special relationship with particular bacteria called rhizobia. These bacteria live in small nodules in the roots of legume plants. Try growing a peanut, pea, or soybean plant. When the plant is mature, look at the roots. Find out more about these nodules by searching online. Why are rhizobia so important to soil?

Use the information you learned to design a quiz or game about plant families. You could use real vegetables or pictures in a matching game. Lead your friends or a 4-H group through the game.



Did you figure out that if you plant cool-season vegetables in the spring, followed by warm-season vegetables in summer, and maybe other cool-season vegetables in the fall, you're already rotating crops without even knowing it? Smart thinking!



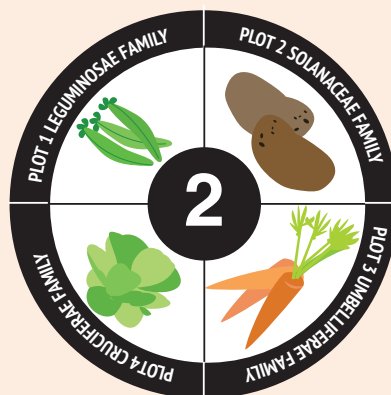
1. Share with your project helper how each plant family is different.

2. What characteristics are most important to you in deciding which vegetable(s) you want to grow?

3. What characteristics are most important to you in choosing friends?

4. When working with different people, how can recognizing their characteristics and differences help you communicate with them?

Sample Crop Rotation Plan



Plan It Bigger

Getting off to a good start

Each plant variety is a little different. Sometimes you choose a plant that grows as a vine or as a compact bush. Other choices involve different colors, taste, shapes, textures, days to maturity, disease resistance, and other characteristics. Some choices are easy; for example, the size of your garden may help you decide. Small gardens do well with bush-type plants because they take up less room.

Some varieties are better than others. Some plants are All-America Selections (AAS) Winners. The AAS designation on a seed packet means the seeds should do well in any part of the country. This is because the plant has been tested in plots all across the United States. Learn more about All-America Selections by visiting <http://all-americaselections.org/>.

Other seeds might be pretreated with a chemical to prevent them from drying out, damping off (see glossary), or rotting in cold, damp weather. These seeds may be a strange color like neon pink, green or blue. Read the labels carefully, and check with gardeners or the people working at a greenhouse, so you don't buy seeds you don't need or that won't do well in your garden. When you order seeds from a catalog, be mindful of the delivery date. The catalog most likely includes a page that indicates the shipping date for your growing zone. The company won't ship seeds to you until the right planting time. If you order from a catalog, allow enough time for delivery.

It's never too cold to start seeds indoors. It's actually a lot like growing a container garden. In this activity, you make a planting calendar so you know when to plant seeds indoors. Timing is important so your transplants are the right size when it's time to move them to the garden.

To develop a planting calendar, you need to know:

- The average last frost date in the spring for your area.
- The time required from planting each type of seed to transplanting it outdoors. (Check the seed packet.)
- The time from transplanting to harvest, if you want to harvest at a particular time.

Many vegetables can be started from seeds inside your home. The easiest plants to start indoors are:

- | | | |
|------------|---------------|------------|
| • Tomatoes | • Cabbage | • Eggplant |
| • Broccoli | • Cauliflower | • Peppers |

Some vegetable plants are easier to start directly in the garden. For example, root vegetables don't want their roots disturbed. Vegetables that don't transplant well and should be started from seeds in the garden include:

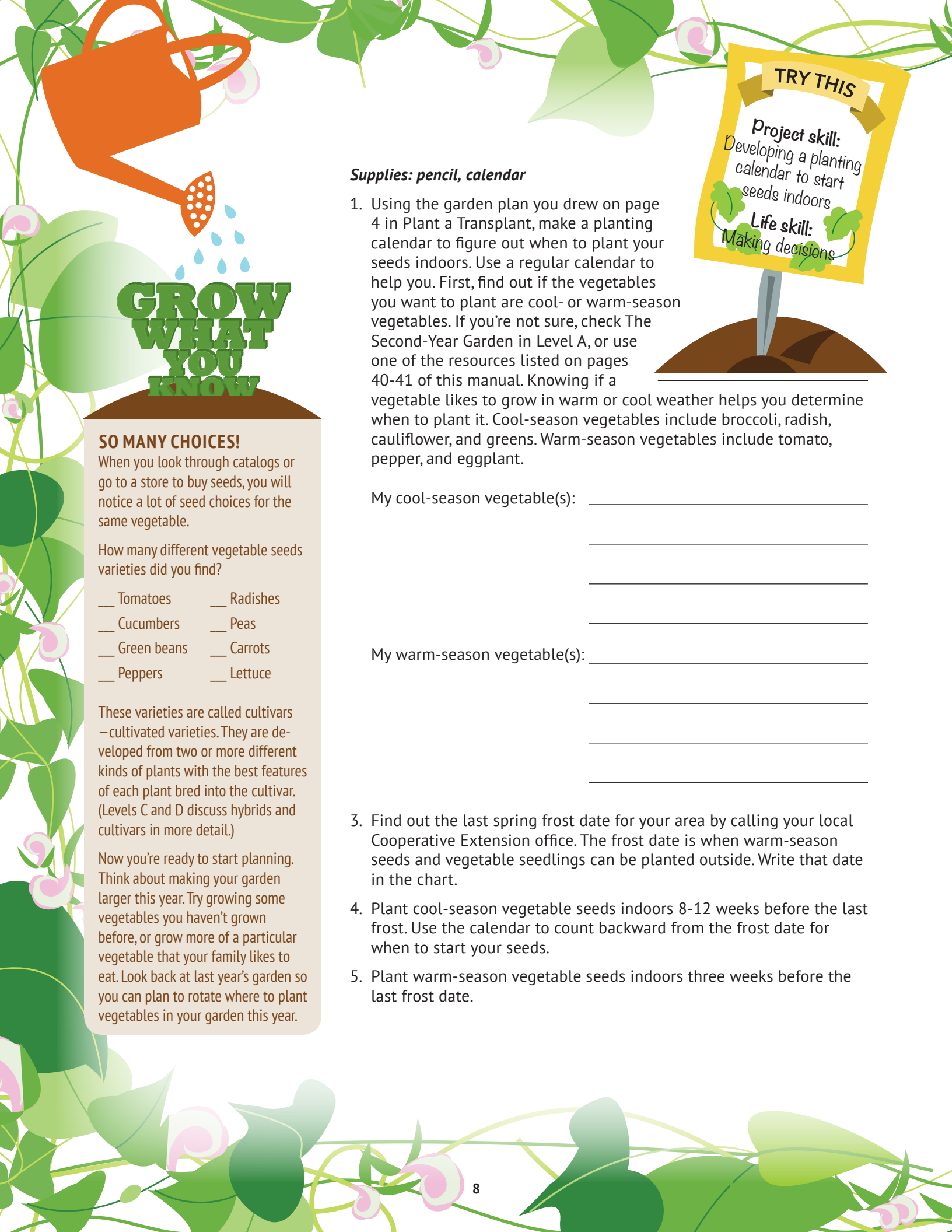
- | | | |
|--------------|-----------|---------------|
| • Beans | • Spinach | • Beets |
| • Carrots | • Corn | • Radishes |
| • Onion sets | • Peas | • Swiss chard |
| • Potatoes | | |

Starting seeds indoors

When it's spring and you can't wait for the ground to warm up, start some seeds indoors. It's easy and fun to watch seeds sprout and grow when it's still cold and dreary outside.

Starting your own seeds also saves money. You get many plants for the price of a packet of seeds, so you can have a bigger garden. You'll also find that you have many choices when you buy seeds. You can grow unusual types and varieties of plants that aren't available at your local garden center.





GROW WHAT YOU KNOW

SO MANY CHOICES!

When you look through catalogs or go to a store to buy seeds, you will notice a lot of seed choices for the same vegetable.

How many different vegetable seeds varieties did you find?

- | | |
|--------------------------------------|-----------------------------------|
| <input type="checkbox"/> Tomatoes | <input type="checkbox"/> Radishes |
| <input type="checkbox"/> Cucumbers | <input type="checkbox"/> Peas |
| <input type="checkbox"/> Green beans | <input type="checkbox"/> Carrots |
| <input type="checkbox"/> Peppers | <input type="checkbox"/> Lettuce |

These varieties are called cultivars – cultivated varieties. They are developed from two or more different kinds of plants with the best features of each plant bred into the cultivar. (Levels C and D discuss hybrids and cultivars in more detail.)

Now you're ready to start planning. Think about making your garden larger this year. Try growing some vegetables you haven't grown before, or grow more of a particular vegetable that your family likes to eat. Look back at last year's garden so you can plan to rotate where to plant vegetables in your garden this year.

Supplies: pencil, calendar

1. Using the garden plan you drew on page 4 in Plant a Transplant, make a planting calendar to figure out when to plant your seeds indoors. Use a regular calendar to help you. First, find out if the vegetables you want to plant are cool- or warm-season vegetables. If you're not sure, check The Second-Year Garden in Level A, or use one of the resources listed on pages 40-41 of this manual. Knowing if a vegetable likes to grow in warm or cool weather helps you determine when to plant it. Cool-season vegetables include broccoli, radish, cauliflower, and greens. Warm-season vegetables include tomato, pepper, and eggplant.

My cool-season vegetable(s): _____

My warm-season vegetable(s): _____

3. Find out the last spring frost date for your area by calling your local Cooperative Extension office. The frost date is when warm-season seeds and vegetable seedlings can be planted outside. Write that date in the chart.
4. Plant cool-season vegetable seeds indoors 8-12 weeks before the last frost. Use the calendar to count backward from the frost date for when to start your seeds.
5. Plant warm-season vegetable seeds indoors three weeks before the last frost date.

1. Share with your helper how and why you decided to make your garden bigger, and which vegetables you plan to start from seeds indoors.

2. What would happen if you didn't have the background information about when to plant seeds indoors?

3. Describe another time you have considered several different ideas before making a decision.

4. How will you decide the "right time" to study for a test at the end of a semester? For buying equipment to play a sport?



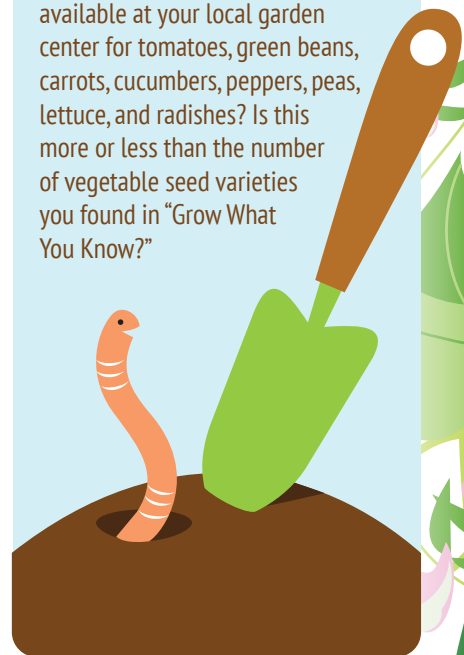
DIG DEEPER

Talk to a gardener, and find out how he or she uses transplants in the garden. Did the gardener grow the transplants from seeds indoors or purchase them? Ask why.

Develop a planting calendar if you want to have extra seedlings ready to give away or sell.

Investigate the last frost date for different areas in the United States. Perhaps you know someone living in another area. Develop a planting calendar for them!

How many different cultivars are available at your local garden center for tomatoes, green beans, carrots, cucumbers, peppers, peas, lettuce, and radishes? Is this more or less than the number of vegetable seed varieties you found in "Grow What You Know?"



Planting Calendar for Transplants

LAST SPRING FROST DATE

3 WEEKS BEFORE FROST DATE

cucumbers
melons
sweet potatoes

8 WEEKS BEFORE FROST DATE

tomatoes
peppers
eggplants
head lettuce
cabbage
broccoli
cauliflower
Brussels sprouts

12 WEEKS BEFORE FROST DATE

sweet onions
celery
herbs

On the Move

Buying transplants

You have completed the planning for this year's garden, which uses transplants as well as seeds planted directly in the garden. This activity is about purchasing the small plants you want to transplant.



When buying transplants, the largest and tallest one is not necessarily the best choice. Follow these tips:

- Buy only sturdy, healthy transplants.
- Look for plants with deep green leaves and that are free of yellowing, brown or black spots, and any leaf or stem injuries.
- Look for plants free of insects and diseases.
- Short, stocky plants are better than tall, leggy ones.

Supplies: *transplants purchased at a garden center, seeds for the rest of your garden, tape measure or yardstick, organic matter or compost, garden markers, shovel, string, four short stakes, rake*

1. When it's time to plant your garden, mark the rows in the garden, and sow your seeds.
2. Give the plants you are transplanting a good watering before taking them out of their containers. This helps prevent exposing roots to the air when the plants are lifted out. (If your plants are growing in individual peat pots, plant them pot and all; the peat breaks down in the soil. Poke a few holes in the bottom of the peat pot so it's easier for roots to grow. Be sure the peat pots are moist before planting.)
3. Dig a hole for each plant you're transplanting. The hole should be about two times wider and the same depth as the ball of soil around the plant. Refer to your planting plan for the correct distances between plants. If you wish, add a handful of compost mixed with soil to the bottom of the hole for extra plant food.
4. Turn the container upside down, and gently pull the plant down and out of the container. This helps reduce shock to the roots. Keep as much soil around the roots as possible.



- 
- 
5. If your transplants are grown in peat pots, set the pot in the holes so the top of the pot is covered, or the pot's rim might act like a wick and dry out the root zone. Set each plant in the hole about an inch deeper than it grew in the container.
 6. Place soil around the roots. Fill in the hole, and leave a small basin around each plant. This helps make watering easier.
 7. Water generously. Don't be afraid of overwatering at this point. Your plant may take a few days or a week to recover from the move. Tomato, pepper, and cabbage plants especially need water for a week or two after you set them out.
 8. Watch your transplants carefully. Don't let the hot sun or windy days worsen the shock of transplanting.
 - If the next few days are sunny, cover the new transplants with newspaper tents to prevent wilting.
 - If it's windy, cover the plants with cardboard boxes, paper bags, or a thin cloth (like an old sheet).
 - If frost is predicted, cover tomatoes, peppers, and eggplants with newspaper tents, cardboard boxes, or blankets. Don't cover plants with metal containers, glass jars, or plastic sheets, which conduct cold that may damage them. There's no wind when it frosts, so newspaper stays put. Leave it in place until just after the sun comes up the next morning.

GROW WHAT YOU KNOW

TOUGHEN UP YOUR PLANTS

It's smart to toughen up plants before transplanting them so outside temperatures or wind won't add to transplant shock. The easy way to do this is called "hardening off."

In the week before transplanting, put the plants outdoors for a few hours each day. On the first day, leave them in partial shade and protected from the wind for just a few hours. Increase the time a little each day. It takes three or four days for plants to get used to direct sunlight. After a week, the plants can stay out all night. Watch the weather, though. If it worsens or in case of a frost warning, move the plants back indoors or cover them well.

Transplanting tips

The best time to transplant is late afternoon or evening on a cool, cloudy, and windless day.

Beginning gardeners often make these common mistakes when transplanting.

- Rushing plants into the ground before they are hardened off (see "Grow What You Know").
- Roughing up a plant while handling it.
- Leaving plants on the ground almost bare-rooted while looking for a tool.

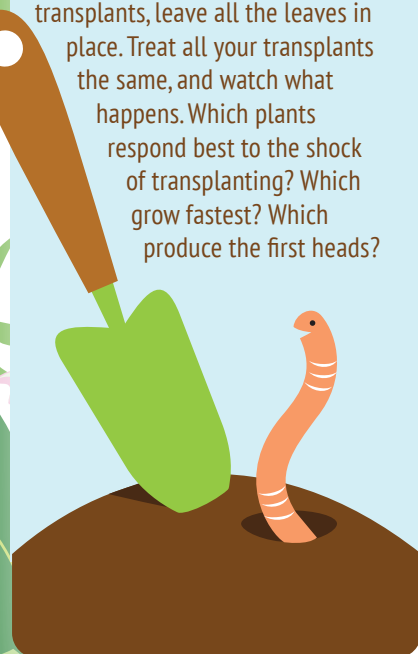


DIG DEEPER

This activity describes transplanting by setting a plant straight into the hole dug in the ground (vertically). Tomatoes can also be transplanted horizontally. See the illustration. Try both ways to find out why someone would want to transplant horizontally.

To transplant horizontally, strip the bottom leaves off the plant. Lay it down on the ground horizontally. Cover the stem with about 3 inches of soil. Which plant blossoms first? Which produces the first harvest? At the end of the season, dig up both plants and look at the root growth along the buried stem. What differences do you see?

Learn more about transplant shock. Take two cabbage transplants and pinch off all the leaves except one. Do not pinch off the center sprout. See the illustration. On two other transplants, leave all the leaves in place. Treat all your transplants the same, and watch what happens. Which plants respond best to the shock of transplanting? Which grow fastest? Which produce the first heads?

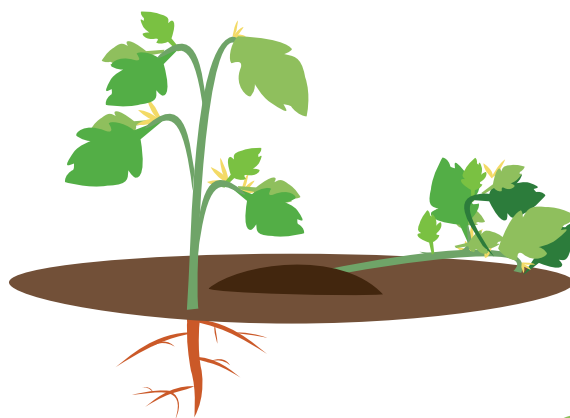


1. Share with your project helper what vegetable plants you transplanted and those you started from seed in the garden. Why did you make those choices?

2. How is transplanting different from starting plants from seeds in the garden? Describe the differences in terms of cost, planting techniques, and care.

3. What other changes are you dealing with right now in your life? Think about school, family, life, and your friends.

4. How can knowing how to deal with a change in how you do some thing help you in the future?



Starting from Scratch

Supplies: seeds to start indoors, clean containers, commercial potting soil (or make your own), pen or pencil, waterproof marker, labels (masking tape or craft sticks), water, spray mister (optional), tray or cookie sheet to hold water draining from containers

Before you start

- Don't use garden soil. It is too heavy and might contain insects, weeds, or diseases that harm seedlings.
 - Plant one type of seed at a time so your containers don't get mixed up.
 - Read the directions on the seed packet for how deep to plant the seed. The general rule is to plant a seed three or four times as deep as the seed's widest point.
1. Wash the containers in warm, soapy water. Rinse well.
 2. If the containers don't have drainage holes, use a pencil or pen to make holes that drain water away from the side or bottom of each container.
 3. Fill the containers almost full with potting soil. Press the soil down a little.
 4. Put two or three seeds in each container. Usually a few won't sprout, so planting multiple seeds ensures one plant per container.
 5. Cover the seeds with a little soil—just enough so you can't see them anymore. Pat the soil with your fingers. Some seeds need light to germinate so you shouldn't cover them up. Read the seed packet for direction.
 6. Use the marker to write the name and variety of the plant on the masking tape or stick. Use it to label the container, or put the stick in the soil at the edge of the container.



Growing your own transplants

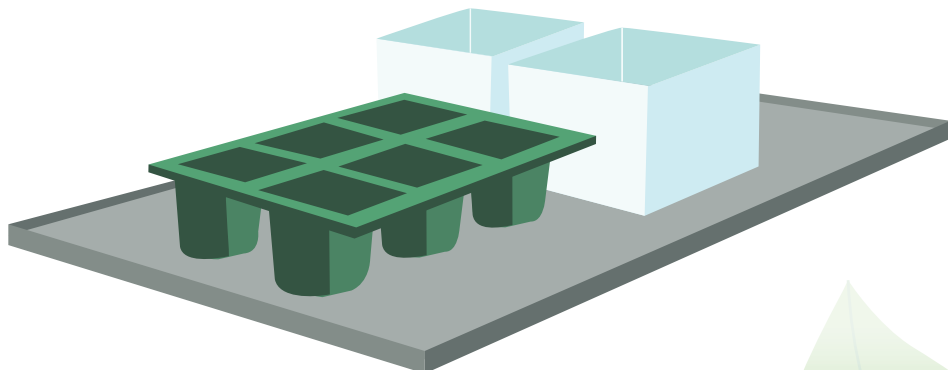
Starting your own seeds to grow transplants for your garden can save money, and it's fun, too! To start seeds indoors, you must have enough light. Lack of light is the biggest problem most growers have. Vegetable seedlings growing under low-light conditions may become leggy and weak, and fall over from their own weight once they're 3 to 4 inches tall.

Growing quality transplants requires:

- High quality seeds
- Well-drained, disease-free potting soil
- Clean containers with drainage holes
- Proper temperature and moisture conditions
- Adequate light

Read the seed package carefully. Some seeds need certain conditions or actions to germinate (sprout) such as:

- Darkness or light
- Specific temperatures
- Overnight soaking
- Nicking the seed coat (scoring)





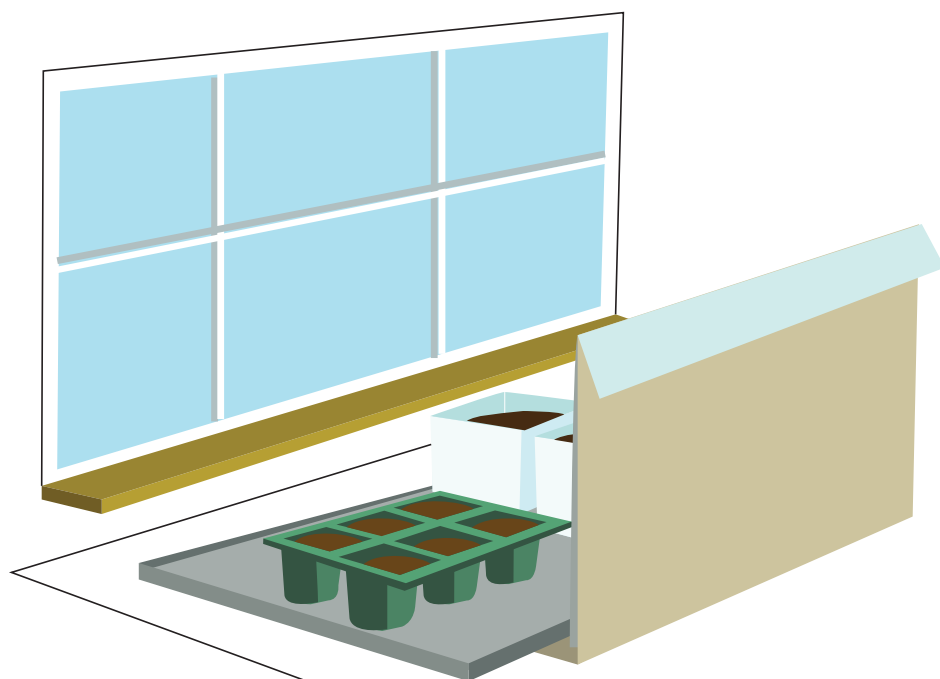
GROW WHAT YOU KNOW

THE IMPORTANCE OF LIGHT

Plants need lots of light. Here are two ways to get more light to your plants.

- Make a reflector by covering a piece of cardboard with foil. Place it behind the containers but so it still faces a window.
- Use fluorescent lights. You don't need a fancy plant stand; a standard fluorescent shop fixture with one cool light and one warm light works well. The lights should be 4-6 inches above the growing plants. Leave the lights on 12 to 16 hours every day. Once your seeds sprout, you may notice they grow toward the window. To get them to grow straight, turn the containers around every other day.

7. Place the containers on a tray, and water carefully so you don't flood the seeds. If you have a spray mister, spray seeds with water often to keep the soil moist. (You can reuse an empty spray bottle, but make sure it is clean.)
8. Place the tray in a warm place, like on top of the refrigerator. Do not put your seeds near a furnace or vent or a large window. Read the directions that came with your seeds, because some need darkness to sprout. Watering seeds that are trying to sprout is important. If they dry out, they die. You can cover the container with a piece of plastic, wax paper, or cloth to keep the soil from drying out.
9. The seeds will sprout in a week or two. Put the containers in a sunny place, like a south-facing window. Test the soil mixture with your finger, and water when the top half-inch of soil is dry.
10. Determine if you need to thin any seedlings. Pinch off weaker seedlings with your finger, or snip with scissors. Don't pull them out, which might disturb other seedlings' roots.
11. When the seedlings are about 4 inches tall, get them used to being outdoors with the hardening off method from *On the Move*, page 11. Place the seedlings outside during the day in a partly shaded place (no full sunlight) when it's not too cold or windy. At night, put them on a porch or other covered place. After a week, plant the seedlings in your garden.
12. Plant the rest of your garden according to your planting calendar.



1. Share with your project helper how you started seeds indoors. Describe how it is different from sowing seeds directly in the garden.

2. Compare making your own transplants by starting seeds indoors to purchasing transplants at a greenhouse or garden center. Consider cost, time, and the final harvest you expect.

3. Why is it important to know about costs and to compare costs before making a decision?

4. Why is it important to make your own buying decisions based on your needs? Your family's needs?



DIG DEEPER

Make a journal or scrapbook of pictures about starting seeds indoors and/or transplanting to your garden. Draw pictures or use photos to illustrate the changes going on in the garden.

Experiment with indoor versus direct seeding. Start some cucumber or melon plants indoors three or four weeks before they should be planted outdoors. Harden them off. Set them in the garden the same day you plant seeds of the same variety directly in the garden. Which method produces the first blossoms? The first fruit? The best yield?

Plant three varieties of a vegetable, such as pole beans, in short rows, so you can compare which climbs the fastest. Which variety climbs highest?

Plant spinach and New Zealand spinach in side-by-side rows. Observe their growth, and compare the days to harvest and how they taste when cooked or eaten raw in a salad. Which plant survives the longest in the garden? Read all you can about New Zealand spinach. Find out if it is a true spinach.

