Garden Time-To-Work Training Guide

www. gardentime.us

Garden Time-To-Work Training Guide
by Kate Lacouture

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Garden Time-To-Work

Garden Time-To-Work uses the 21st Century Skills Framework for workforce readiness & learning skills development in students, with a focus on:

Life & Career Skills
Leadership
Responsibility
Productivity
Accountability
Cross-cultural skills

Learning & Innovation Skills
Critical thinking
Communications
Collaboration
Creativity to help build capacity for careers in today's world

Environmental Literacy
e.g., demonstrating knowledge & understanding of the environment and the circumstances & conditions affecting it; taking individual & collective action towards addressing environmental challenges.

—For more information, see Appendix A & the Partnership for 21st Century Learning, http://www.p21.org/our-work/p21-framework

Learning skills are highlighted in blue boxes throughout this guide.

Welcome to Garden Time-To-Work!

Garden Time-To-Work is a vocational training program focused on the practical skills and knowledge necessary for employment in the fields of agriculture, landscaping, and other green industries as well as the critical 21st century learning skills that aid students in any future employment. The program was developed with input from local employers and practitioners in these fields.

The Garden Time-To-Work program runs for 35 weeks, from mid-March to mid-November. Learning takes place in both the classroom and the garden and consists of three main components:

- **Garden-based Knowledge & Technical Skills Acquisition**: Through classroom assignments, guest presentations, and hands-on learning experiences, students explore relevant topics and build essential skills in landscaping, agriculture and related fields. Students focus on the basics—what you need to know and why. Local practitioners share their expertise and insight gained from their respective fields. Over the course of the program, students are able to determine which jobs they are interested in and well-suited for and whether further education and training is required.
- **Life Skills & Confidence-building**: Throughout the program, students explore the learning strategies, interpersonal skills and resources necessary to gain and maintain long-term successful employment in any job field.
- **Experience in the Garden:** Between hands-on learning experiences and regular garden maintenance, students spend over 60 hours in the garden. They experience the peacefulness of quiet, self-directed work as well as the satisfaction of working as a team to accomplish a shared goal. As a result of time spent outside in the garden, students have the opportunity to develop a stronger connection to nature. This appreciation for the natural world along studying environmental literacy topics—organic farming, food justice, and climate change—help students develop an environmental ethic to guide future decision-making.

Garden Time recognizes that students have different ways of learning. Throughout this guide, information is presented graphically for visual learners and in accessible, straightforward text. Students are provided opportunities for further study through projects and reading assignments.

DIG DEEPER: Topics in orange throughout guide direct students to ways to learn more about a particular topic

What do you look for in an employee? Garden Time asked local employers this question & their answers are featured in green boxes throughout this guide. Rather than particular skills or certifications, most employers stressed the importance of characteristics like reliability, positive attitude, work ethic & being a team player. Students will focus on recognizing & building these positive qualities in themselves in Garden Time-To-Work.

Introduction to Landscape Maintenance—The Spring Clean-up

Whenever you are working in a garden, start with a few guidelines:

Avoid compacting soil: Stay off garden beds especially when soil is wet.

Learn how to use and care for tools: There is a tool for every task.

Figure out what you need to know: Gardening is a lifelong learning pursuit. There is always something new that comes up, so learn to find the information you need.

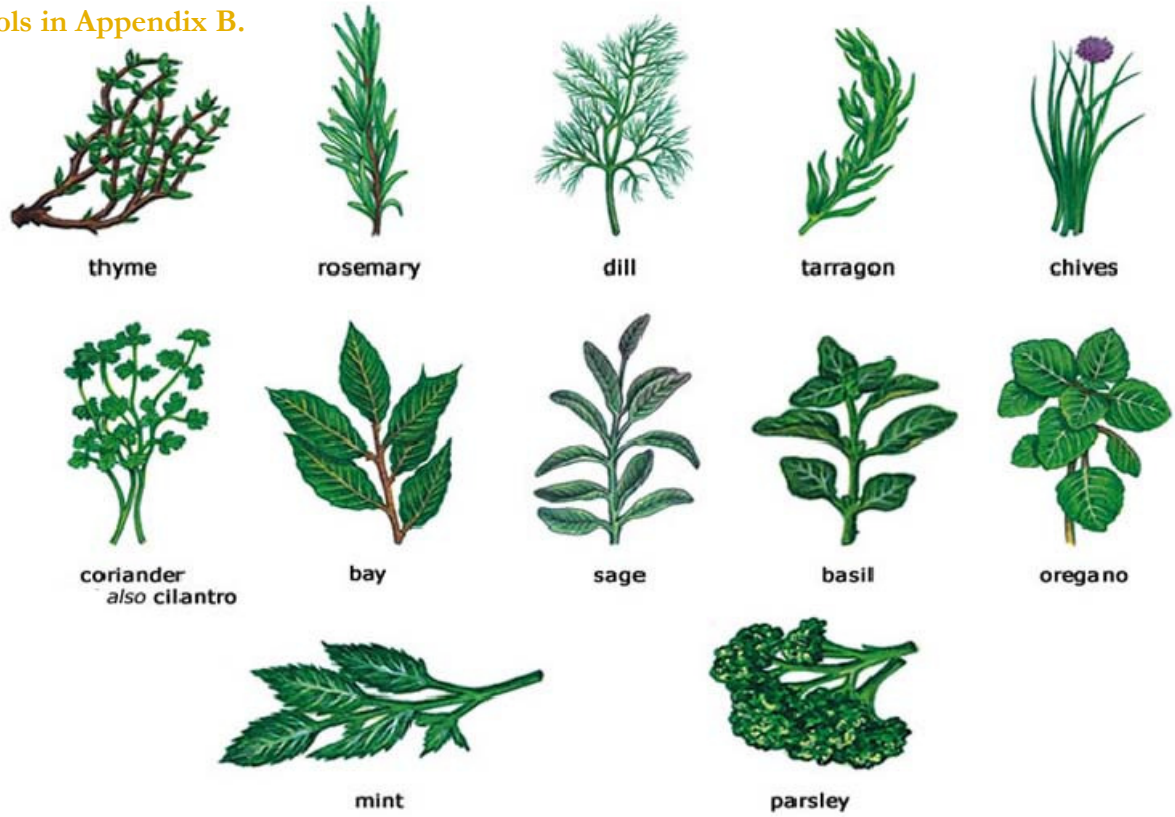
Landscape maintenance tasks depend on the type of garden and the preference of the client. You will learn to weed, edge beds, cultivate, fertilize, mulch and plant new perennials, shrubs and trees, but we start with spring garden bed clean up.

Don't start too early—after you rake the leaves out of garden beds, plants are more vulnerable to frost so make sure it's really spring. You can support beneficial insects by waiting until there has been a week of 50-degree weather to make sure they aren't still overwintering in the leaf debris.

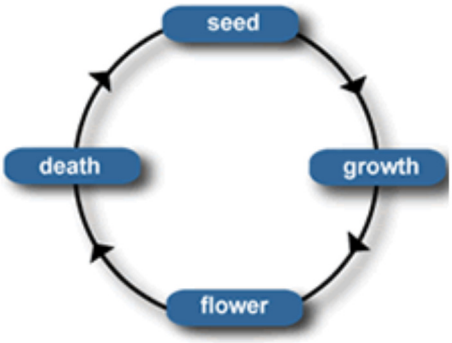
To clean out a garden, you must understand the life cycles of plants to know whether to cut them back or pull them up. If seed pods were left on perennials through the winter, use hand pruners to cut back old growth. Annuals left from the past season can be pulled up by the roots.

Happy Spring!

DIG DEEPER: Learn more about tools in Appendix B.

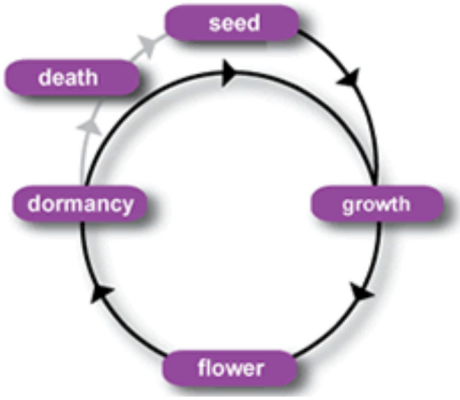


What do you look for in an employee? *"When looking for the best employee for the job the first thing I try to do is get a good sense of work ethic. The most important thing in this field is not prior knowledge and experience, it's how hard you are willing to work to achieve goals in the field. A hard worker who is willing to go the distance in the rain, heat, and snow as well as learn the trade is the best candidate for the job."* -Steve Ricci, Groundwork RI



An annual lives out its life in one year: a seed is planted, it grows, flowers, makes seeds and dies. Many annuals self-sow their seeds.

A biennial has a two-year life cycle: it produces vegetative growth the first year and flowers and seeds the second year. Biennials are not very common.



A perennial lives for several years. It may look dead in the winter but it is dormant. It produces new vegetative growth, flowers, & seeds each year.

Annual Herbs	Biennial Herbs	Perennial Herbs	Mint	Tender Perennials
Basil	Parsley	Chives	Oregano	Rosemary
Cilantro		Lemon Balm	Sage	Stevia
Dill		Lovage	Tarragon	Lemon Grass
		Marjoram	Thyme	

(RETHINKING) WEEDS

A "weed" is not a botanical designation; it is simply a plant in the wrong place. Some weeds give us a reason to pause before pulling—many are edible, have medicinal value, are important sources of pollen & nectar for bees, or are just plain pretty. The dandelion (*Taraxacum officinale*) is all of those. That said, you will be an asset to your employer if you can identify weeds, know how they spread and the best ways to get rid of them.

DIG DEEPER: Learn to identify common weeds in Appendix C.

FIELD SKETCHING—DOCUMENT TO LEARN. A good way to start learning to identify plants is to draw simple sketches with notes about their characteristics. Don't be intimidated if you think you aren't good at drawing—you don't have to create an artistic masterpiece. Just take some time to observe a plant in the garden and then try to capture some basic information—its size, shape, color, leaf & flower with a combination of sketches and notes. Continue to record information through the seasons. Like anything else, field sketching gets easier with practice!

Planning the Spring Food Garden

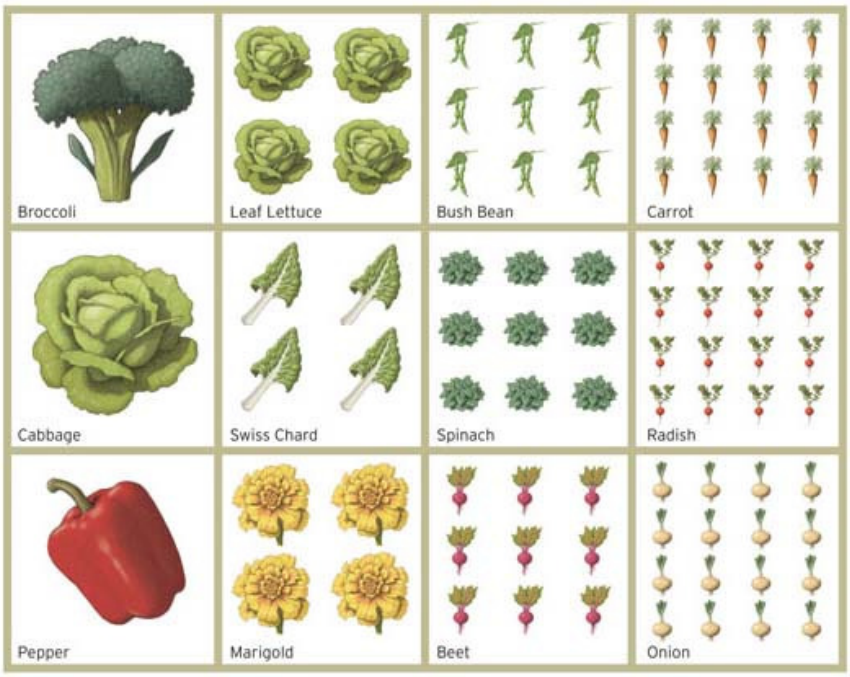
Before you start planting, get organized and make a crop plan. Figure out what you want to grow and where it should go in the garden.

Most crops can be planted outside from seed. Many plants like peas and root vegetables prefer to be planted by seed in the garden rather than transplanted when they are seedlings. Tomatoes, peppers & eggplant require a longer growing season than the RI climate provides so they must be started indoors & transplanted to the garden or purchased as seedlings.

Cool-season crops (spinach, peas, root vegetables, etc.) can be planted early in the spring while warm-season crops (tomatoes, basil, cucumbers, etc.) need warmer soil for their seeds to germinate. By mid-May it is usually safe to plant and transplant warmer crops. Some cool season crops can be planted again in late summer for a fall harvest. To get the most out of your garden, use succession planting—plant an early crop in the spring and a later crop after the first has been harvested.

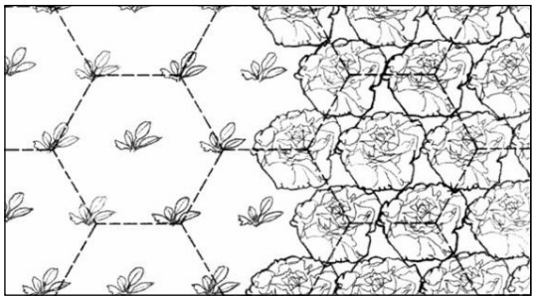
Consider space-saving methods such as square foot gardening or biointensive planting patterns when you are planning your garden.

DIG DEEPER: Learn when to plant different crops with the RI Planting Guide in Appendix D.



Plant spacing varies depending on the size of the mature plant—don't be fooled by how small seedlings are. Square foot gardening (above) & bio-intensive planting (right) can help make the most of a small garden plot.

Important planting information including preferred conditions, seed depth & spacing can be found on the back of most seed packets .



What do you look for in an employee? *"We look for employees that are reliable, hard-working, and able to think on their feet. In farming, things can come up unexpectedly or go wrong at any time, so we need someone who is adaptable, able to communicate, and interested in problem-solving. Efficiency is crucial on a production farm, so a good work ethic and ability to keep up a fast pace are essential. Attention to detail and ability to listen and follow directions are equally important. Must be able to work with a team as well as independently. All in all, most of the more technical skills are trained on-the-job, so it is the underlying work ethic that is most important to us."*
—Emily Cotter, Casey Farm

Planting Seeds in the Garden

Prepare the planting bed by turning over cover crop, pulling out weeds, and loosening the soil with a fork. It's a good idea to add a couple inches of compost to the beds in the spring, but make sure to mix it in so you aren't just planting in the compost. Determine the seed depth and spacing by using information on the seed packet as a guide along with space-saving patterns. Mark the seeds with a label & record the crop variety and the date planted in a garden notebook.

Plant a seed— here are a few ways to do it:

Seeds are planted in rows or some can be spread or "broadcast" in a larger area. To plant a row (below left), loosen soil & make a small furrow with finger. Place seeds at proper spacing & gently cover. To broadcast, (below center) loosen or rake soil, spread seeds & lightly cover with soil. For large-scale growing and commercial operations, there are many types of mechanical seeders (below right) to make planting seeds more efficient.

Water seeds gently & keep soil moist until seeds germinate & grow.

Crops can be planted in rows (top) or more densely "broadcast" (bottom).

Planting Pitfalls:

Don't use the back of rake handle to make seed holes—it will compact the soil. Don't plant more than one seed in a hole unless you are planning to thin the seedlings. Don't water too much or too forcefully or seeds will be displaced. Don't let newly planted seeds dry out once they have germinated & begun to grow.

ACTIVE LISTENING—PREPARING FOR A GUEST SPEAKER Whether you are part of an audience, in a job interview, or interacting with an employer, it is not enough just to passively listen. Through body language cues such as nodding your head, maintaining eye contact, and even taking notes, you can show that you are engaged. Remember that the speaker gets energy from your reaction. It is hard to talk to a group of people who are not paying attention or look bored. Don't talk while the speaker is talking and don't interrupt. A speaker may encourage you to ask questions along the way or to hold them until the end of the presentation. In either case, be polite and don't interrupt. Raise your hand or make a note of the question you want to ask at the end.

Parts of Plants & What They Do

SEEDS hold everything a plant needs to make a new plant. The process of a seed growing into a seedling is "germination".

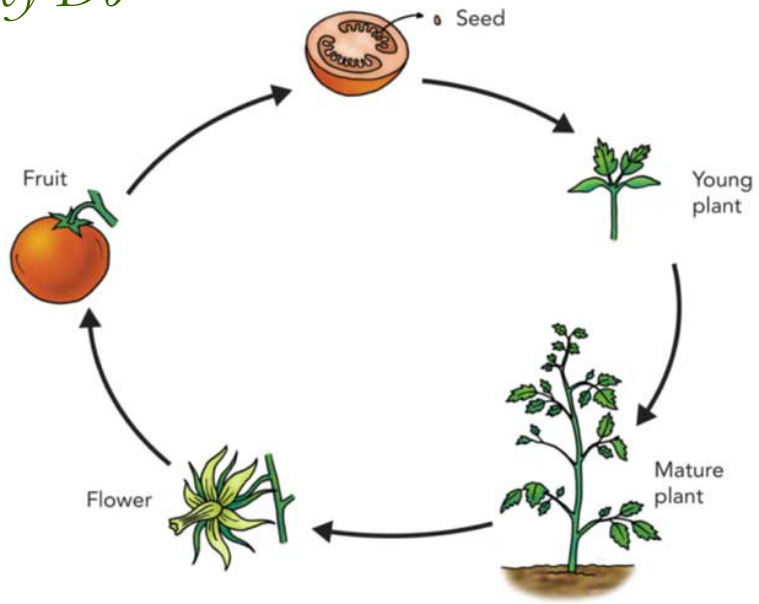
LEAVES capture sunlight which allows the plant to make food through the process of "photosynthesis".

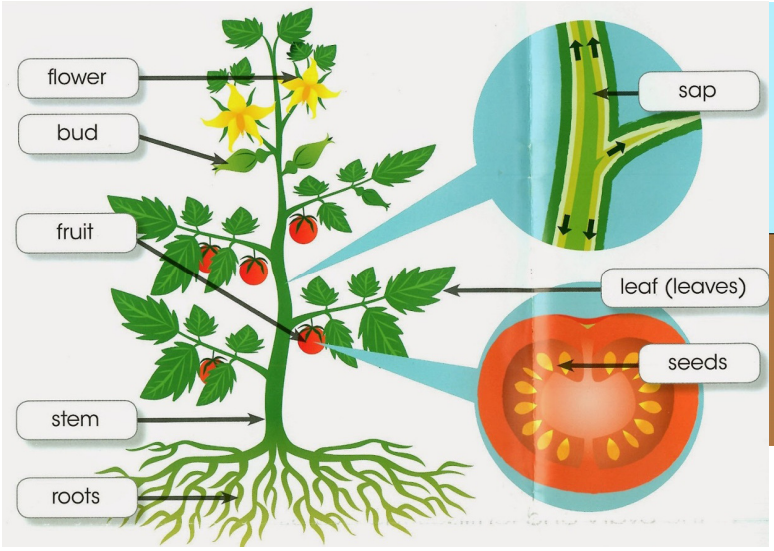
STEMS hold the leaves up to the sun and carry water and nutrients throughout the plant.

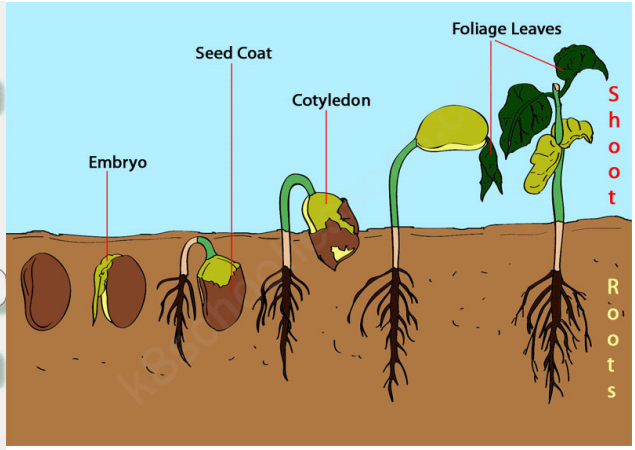
ROOTS anchor the plant in place and take in water and nutrients from the soil.

FLOWERS make fruit and seeds through the process of "pollination".

FRUIT encloses and protects the seeds.



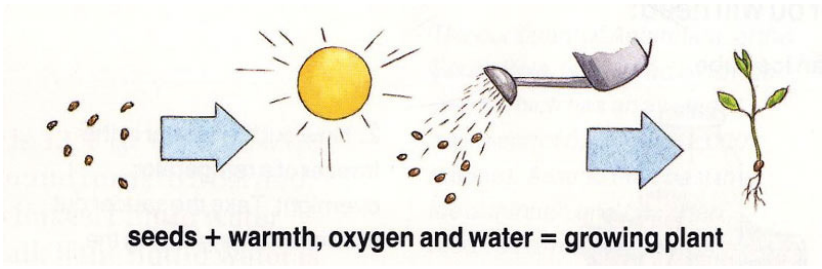




The life cycle of a tomato plant (top) & the parts of a tomato plant (left). A seed "germinates" & grows into a seedling. (above).

The germination of a pea seed.

Introduction to Seed Starting & Growing Indoors



Why? Some crops (ex. tomatoes, peppers, and eggplants) need to be started inside by seed to get a head-start on the season.

When? Seed packets will tell you to start seeds inside a number of weeks before you want to plant in the garden so work back from your planting date. For example, tomatoes need to grow for about 6 weeks before going into the garden. Count back six weeks from mid-May when they can be put out in the garden and start tomatoes at the end of March or beginning of April. If you start them too early, they can get too "leggy" before it is time to plant them outside.

How? You will need a good quality seed-starting mix, seeds, and containers with drainage holes on the bottom. (You can buy pots, repurpose other containers, or make your own.) Moisten the soil before using by adding warm water until it is absorbed. Fill containers with soil & place them on a tray that will hold water. Plant seed according to the depth on the seed packet. Use a pencil point to gently make the soil. Cover planted containers loosely with plastic to keep moisture in. Keep seeds in 65-70 degree temps while they germinate. Remove cover when seedlings emerge. Set up grow light and place tray of seedlings beneath lights. A sunny window isn't enough light for some plants. Water by filling the bottom tray and letting seedlings wick up the water. Feed growing seedlings with a diluted mixture of fish emulsion. Repot in larger containers as they grow and need more root space. Use a good quality potting soil. Continue to water and feed until it is time to plant outdoors. Harden off seedlings before planting outside. Hardening off means exposing them to the sun and wind outdoors in increasing intervals and is critical for their survival.



Start seeds indoors to grow seedlings to transplant (left) or for microgreen production (center) using a grow light (right).

Growing Microgreens

Microgreens are tiny edible seedlings, harvested when the plants are only a couple weeks old, depending on the crop. They have all the nutrients of the mature plant in a small seedling. They are tasty and can be added to any meal and are a popular garnish in fancy restaurants . Grow microgreens like other seeds except for a few exceptions: plant in a perforated tray that fits inside a water-tight tray. Spread the seeds thickly on top of the soil and press gently. Cut them with scissors when they are ready.

Harvest microgreens when they are about 2" tall.

HOW TO FIND RELIABLE INFORMATION ON THE INTERNET You can answer any question—all you have to do is "google it", right? The challenge is wading through all the information to make sure what you have found is accurate. Here are some tips: Consider the source. Information found on websites with .edu and .gov endings are generally scientifically-based and reliable. Websites with .org endings tend to be non-profit organizations. Understand their perspective since some advocacy groups have a political bias so . Other questions to ask yourself: Is the website trying to sell you something? Is the information current? Is the person an authority on the subject? Check the accuracy of the information against other sites.

Introduction to Soil & Soil Testing

Don't treat soil like dirt. Get in the habit of staying off planting beds. When soil is compacted, water and air can't get to the roots.

Get all the information you need. Soil testing takes some of the mystery out of plant health and comes with recommendations to bring the pH and the nutrients to levels best for the plants you want to grow. UMass Extension is a great resource for soil testing.

Grow safely. Lead levels can be high in soil, especially in urban areas and lead poisoning is a serious health risk. Test the soil to determine if edible crops should be grown in raised planting beds rather than native soil.

UMass Extension

Why Test Soil?

Here are five good reasons!

Nutrient levels - Test results provide you with soil nutrient levels and fertilizer recommendations when needed.

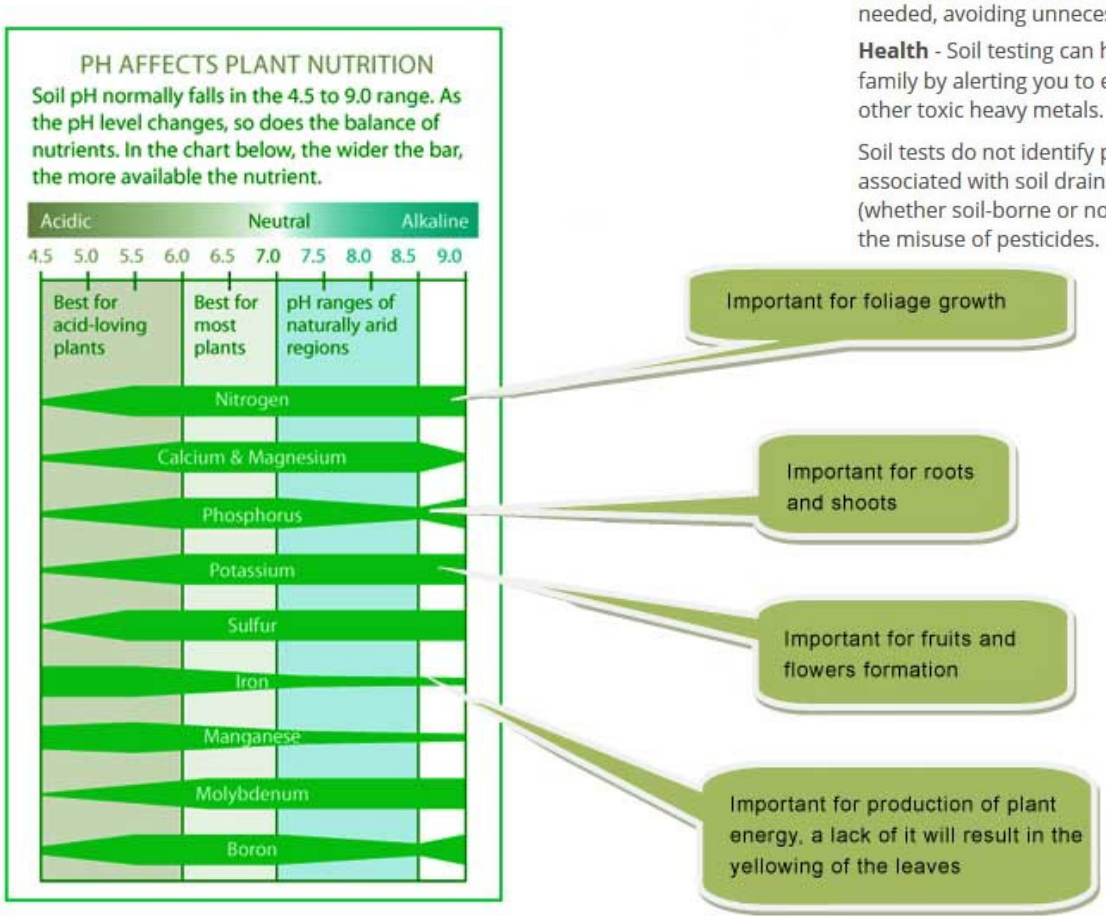
Soil Acidity - Soil pH and exchangeable acidity are measured for the determination of lime requirements.

Environmental Protection - Test results identify areas with excess nutrients that can pollute local waterways.

Economics - You buy soil amendments only when needed, avoiding unnecessary spending.

Health - Soil testing can help protect you and your family by alerting you to elevated levels of lead or other toxic heavy metals.

Soil tests do not identify plant growth problems associated with soil drainage, insects, plant diseases (whether soil-borne or not), weeds, winter injury or the misuse of pesticides.



When you get your soil pH in the right spot (6.2-6.9), you unlock the fertility of the soil and lock up the toxic metals.

GARDEN MATH: Units of Measure, Area, & Perimeter

When recording measurements, the convention is to use ft or ' (single apostrophe) to signify "feet" and use in or " (quotations) to signify inches. For example, to record a three foot length, write 3' or 3'-0"

To find the area of a space, multiply the length by the width. For example, if a rectangular garden bed is 4' wide and 10' long, the area of the garden bed is 4' x 10' = 40 square feet (also sq-ft, ft^2)

To find the perimeter of a space, add the sides together. For example, if a rectangular garden is 10' wide and 15' long, the perimeter of the space is 10' + 15' + 10' + 15' = 50 linear feet (also LF, LFT)

The most critical step in soil testing is collecting the sample. It is important that you take the necessary steps to obtain a representative sample; a poor sample could result in erroneous recommendations.

The first step is to determine the area that will be represented by the sample. Soil physical appearance, texture, color, slope, drainage, and past management should be similar throughout the area. It may be helpful to draw a map of the property and identify areas where you will collect samples. Using a clean bucket and a spade, auger, or sampling tube collect 12 or more subsamples to a depth of six to eight inches (four to six inches for turf) from random spots within the defined area. Avoid sampling field or plot edges and other nonrepresentative areas. Avoid sampling when the soil is very wet or within six to eight weeks after a lime or fertilizer application.

Next, break up any lumps or clods of soil, remove stones, roots, and debris, and thoroughly mix subsamples in the bucket. Once the sample is thoroughly mixed, scoop out approximately one cup of soil and spread on a clean sheet of paper to air-dry. A fan set on low will help speed the drying; do not apply heat. **Do not submit wet soil samples to the lab.**

Place approximately **one cup** of your dry sample in a plastic zip-lock bag. Label each ziplock bag with your sample ID (you create this) and complete the submission form.

UMass Extension Order Forms for 1.) Standard Soil & 2.) Metals Tests:

1.

LAB # (Leave blank)	Sample ID (You create this)	Approx. area represented by sample (sq ft. or acres)	Crop Code, limit of 3 (See reverse side of this form)	Routine analysis ($15.00)	Organic matter ($6.00)	Soluble salts ($6.00)	Nitrate ($6.00)
				☐	☐	☐	☐
				☐	☐	☐	☐
				☐	☐	☐	☐

Crop Codes for Home Grounds and Gardens

To receive lime and nutrient recommendations on your test report, you must specify the appropriate Crop Code(s) on your soil sample submission form. These recommendations are based on analytical results for your sample. Please select up to three Crop Codes that best describes your management objectives from the list below.

Home Lawns – *Recommendations given per 1,000 sq. ft.*

Description	Crop Code
Lawn-New Establishment	HA1
Lawn-Maintenance	HA2

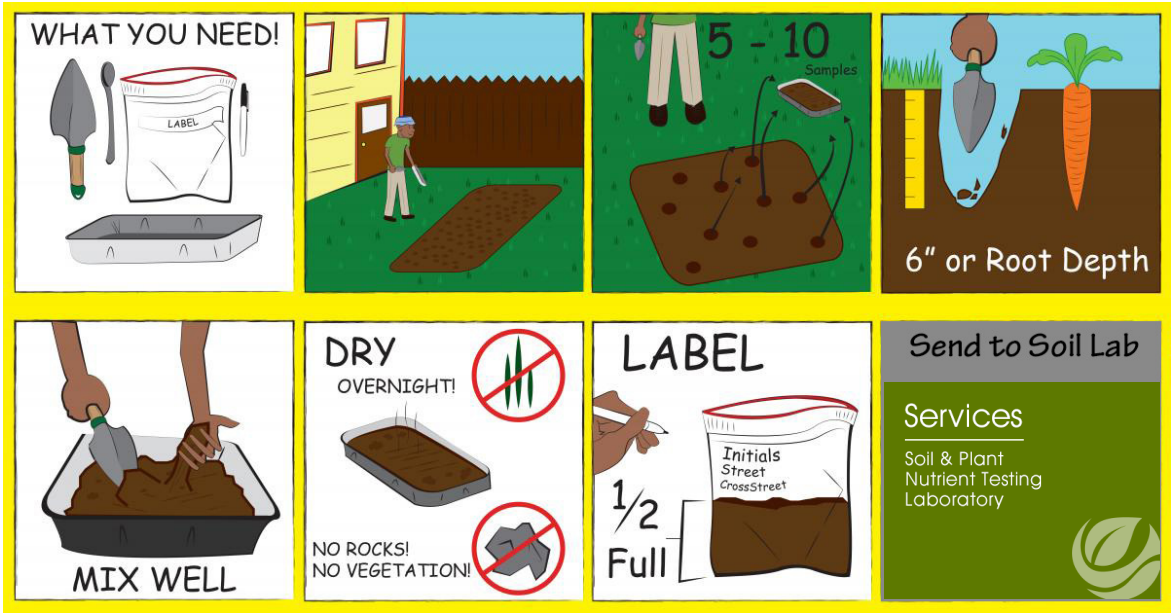
Home Gardens, Trees and Shrubs – *Recommendations given per 100 sq. ft.*

Description	Crop Code
Home Vegetable Garden	HB1
Flowers, Roses, & Herbs	HB3E
Deciduous Trees, Shrubs & Vines-New Establishment	HC1E
Deciduous Trees, Shrubs & Vines-Maintenance	HC1M
Needle Leaf Trees & Shrubs-New Establishment	HC2E
Needle Leaf Trees & Shrubs-Maintenance	HC2M
Acid-loving Trees, Shrubs, & Groundcover-New Establishment	HC3E
Acid-loving Trees, Shrubs, & Groundcover-Maintenance	HC3M
Home Blueberries-New Establishment	HD1E
Home Blueberries-Maintenance	HD1M

2.

LAB # (Leave blank)	Sample ID (You create this)	Total Metals: Lead, Nickel, Cadmium, Chromium, Zinc, Copper ($55.00)	Optional Additional Metals: Arsenic ($5.00)	Selenium ($5.00)	Molybdenum ($5.00)
		☐	☐	☐	☐
		☐	☐	☐	☐

How to Collect a Soil Sample:



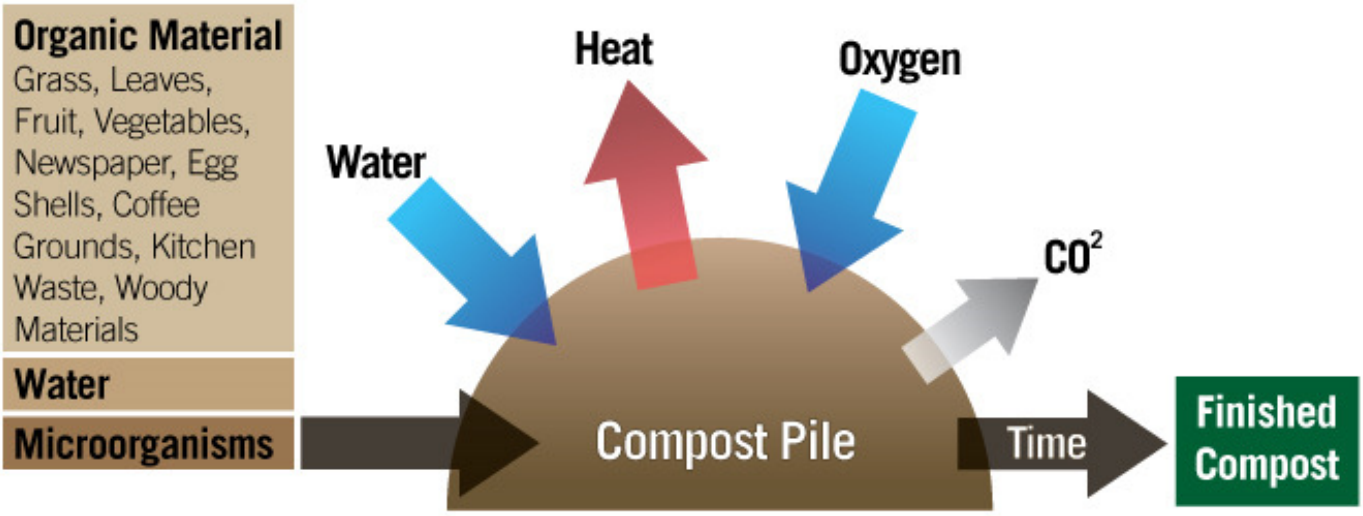
Introduction to Composting

Composting is the process of turning food scraps, grass clippings, and other organic materials into a rich soil conditioner called compost. Organic "waste" is actually loaded with nutrients that can be recycled back into the soil.

For high quality compost add organic materials in a ratio of 3:1 C:N, that is 3 parts carbon-rich materials or "browns" (dried leaves, straw, newspaper, etc.) to 1 part nitrogen-rich materials or "greens" (kitchen scraps, grass clippings, etc.). Materials are mixed in layers along with water and oxygen or aeration from turning the pile.

Add compost to garden beds to increase the organic matter to the soil, thus increasing the soil's ability to hold water.

The process of composting recycles yard waste & food scraps into a rich soil conditioner.



Heat is released as soil microorganisms break down the organic matter in a compost pile.

A three-bay compost bin (left) allows for piles in different stages of decomposition. Vermicomposting or worm composting (right) uses red wiggler worms to process food scraps. The "castings" aka worm poop are an extremely rich fertilizer.

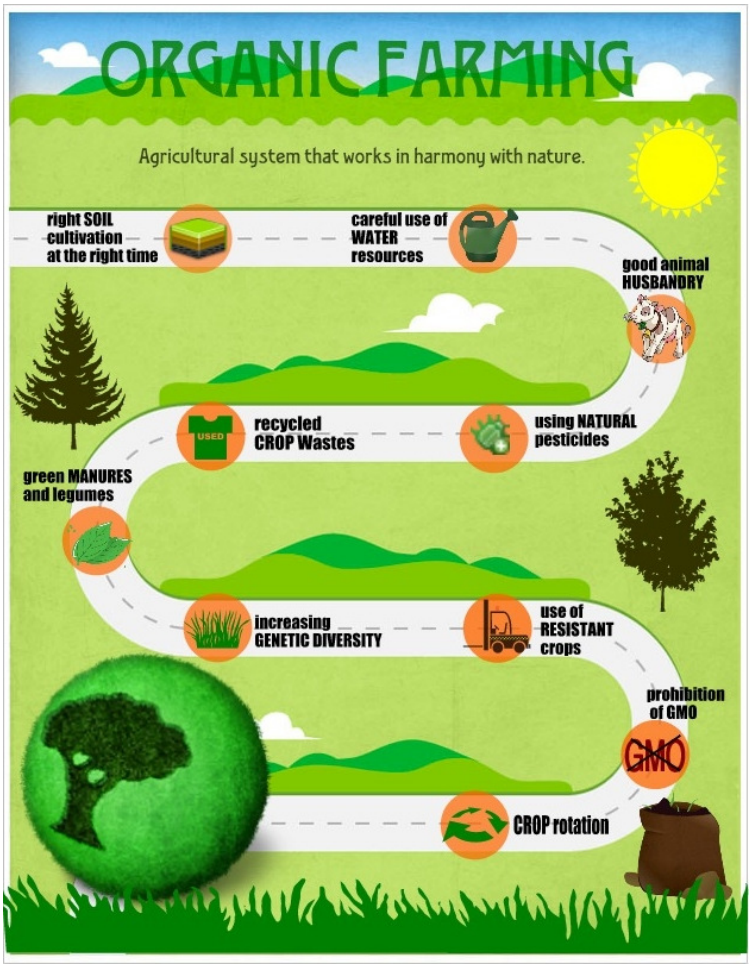
What do you look for in an employee? *"I came across a list of things to look for in hiring employees that I think are so much more important than having a specific skill set: Punctuality, Work Ethic, Effort, Body Language, Energy, Attitude, Passion, Being Coachable, Doing Extra, Being Prepared. We can teach people what we need to have our employees do during the work day, but someone coming into our workplace with these other attributes already in place is of great value."* –Nat Harris, The Compost Plant

Environmental Literacy: Sustainable Gardening

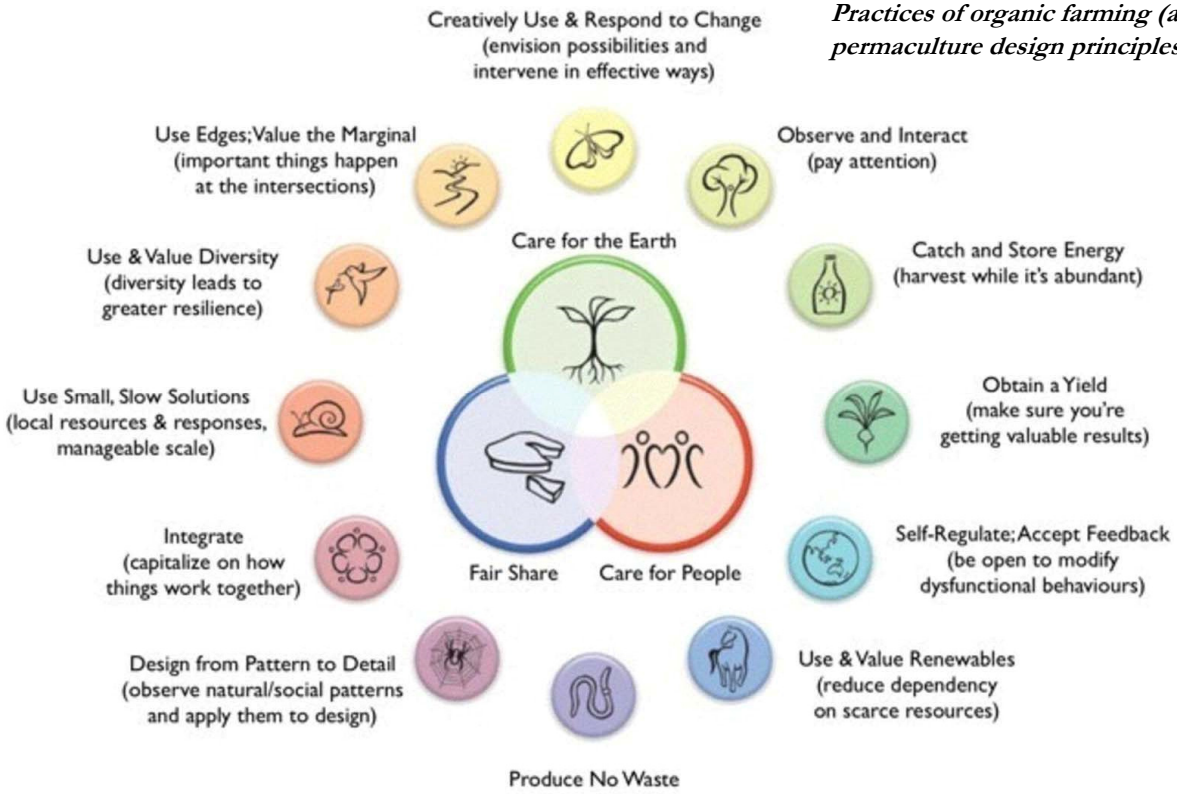
Principles of organic farming

Sustainable gardening comes in many forms. Organically-minded growing, certified organic farming, and permaculture generally follow the same principle of sustainability—making sure that our actions today don't negatively affect future generations. They also use nature as a model. In nature, everything is recycled—there is very little waste.

Organic growers focus on building healthy soil. They plant cover crops to add fertility back into the soil. They turn garden and animal waste into compost which is put back into the garden. They mulch to conserve water by keeping moisture in the soil. They plant diverse species in order to attract beneficial insects to pollinate their crops and take care of pests. They don't use pesticides or genetically modified (GMO) seeds.



Practices of organic farming (above) & permaculture design principles (below)



Introduction to Culinary Herbs

Culinary herbs are used for their flavor in cooking. Many culinary herbs are used medicinally as well.

BASIL
Ocimum basilicum
Annual

CILANTRO
Coriandrum sativum
Self-sowing annual

DILL
Anethum graveolens
Self-sowing annual

PARSLEY
Petroselinum crispum
Biennial

ROSEMARY
Rosmarinus officinalis
Tender perennial

CHIVES
Allium schoenoprasum
Perennial

STEVIA
Stevia rebaudiana
Tender perennial

OREGANO
Origanum vulgare
Perennial

SAGE
Salvia officinalis
Perennial

THYME
Thymus vulgaris
Perennial

EGYPTIAN WALKING ONION
Allium proliferum
Perennial

LEMON GRASS
Cymbopogon citratus
Tender perennial

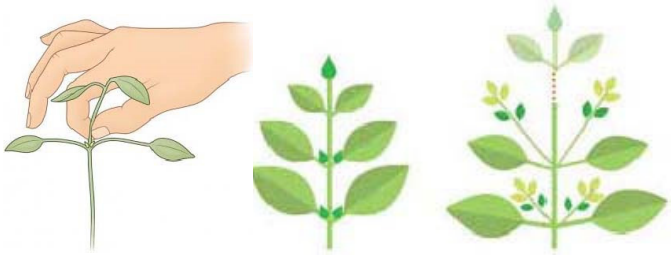
MARJORAM
Origanum majorana
Perennial

TARRAGON
Arteminsia dracuncuklus
Perennial

SPEARMINT
Mentha spicata
Perennial, spreads

LOVAGE
Levisticum officinalis
Perennial

Introduction to Harvesting Herbs

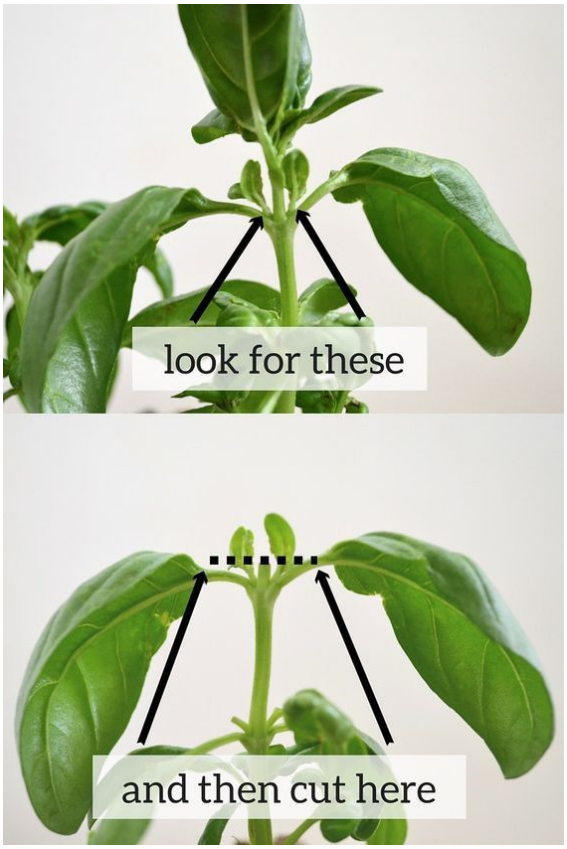


Herbs can be used fresh or dried for later use.

When? Timing is important. Most herbs are harvested before flowering. Once a plant flowers, it focuses on setting seeds and reproduction, so if you are harvesting an herb for its leaves, do it before it flowers.

Pinch back basil before it flowers to encourage growth & keep it from "going to seed".

Don't harvest herbs when they are wet. Harvest in the morning, after the dew has dried but before herbs are wilted from the hot sun. Don't leave herbs in direct sunlight; put them in the shade as soon as possible.



How? Use a tool that is comfortable and allows you to harvest quickly and efficiently. For a large harvest, a sharp serrated harvesting knife may work better than hand pruners to keep hands from getting tired.

Make sure herbs are free of dirt and pests. To bundle, gather herbs in bunches stems, about the size you can hold in your hand. Make sure all the bundles of herbs are the same size. Put elastics at the end of the bunched stems to minimize the potential damage to the leaves along the stems.

Put harvested herbs in baskets or crates with air holes to let them breathe. Don't use plastic bags or herbs can get moldy.

Herbs don't last very long once they have been harvested, so harvest on the day you will deliver, sell or use the fresh herbs. To air dry herbs, hang in bunches in a warm, well-ventilated place or store loosely in paper bags with holes cut for air circulation. Herbs are thoroughly dry and can be packed up after about month.

DIG DEEPER: Learn to identify herbs by sight and scent.

PRESENT YOURSELF—THE ELEVATOR PITCH When a potential employer says "Tell me about yourself", where do you begin? It helps to have an "elevator pitch" prepared. The elevator pitch concept is based on the idea that you only have a few minutes to sell yourself or an idea to someone you meet in an elevator.

An elevator pitch is a sales pitch. Your goal is to spark their interest & make them want to hear more about you. It should be concise—you only have about 30-60 seconds to make your case. Introduce yourself. Share your skills and experience. Be positive. Focus on what you will bring to the job.

Once you have your pitch written, there's one thing left to do. As with anything you want to improve, practice! Practice enough that it feels and sounds natural. Then practice some more!

What do you look for in an employee? *"1) Punctuality is a must. 2) Be prepared for hard physical labor: weeding for hours, rock picking, harvesting, lifting 40 to 50 lbs; repetitive tasks. 3) Ability to work in all weather conditions: rain, heat, humidity, & wind. 4) Farming is production work. The farm earns money by what is actually produced and sold; farmers get paid by the piece, meaning revenue is generated by the watermelon, head of lettuce, or bunch of herbs sold. Since production per hour or day is very important, employees are expected to work quickly and efficiently. 5) Not worried about getting dirty, ruining clothing, stung by a bee or physical exhaustion."* –Christina Dedora, Blue Skys Farm

Introduction to Organic Lawn Care

Too many homeowners have been influenced by lawn care commercials telling them they must have a "perfect" green lawn for a front yard. But a so-called perfect lawn can be problematic. A lawn is a monoculture requiring a lot of water and mowing to keep it perfectly green and trimmed. Many are treated regularly with chemical fertilizers that run off into catch basins to pollute local waterways resulting in fish kills and algae blooms. They get regular pesticide applications which may kill the grubs eating the roots but also kills all the life in the soil and is dangerous for kids and pets.

As a landscaper, you might be able to convince your clients to try something different. Show them photos of more interesting front yards that include plants that support wildlife and pollinators. Suggest they grow food in part of their yard. Explain how a "wild lawn" is a mix of grass species including clover enriches the soil and provides food for the bees. And if they insist they need some grass for their kids to play on, convince them to care for it organically.

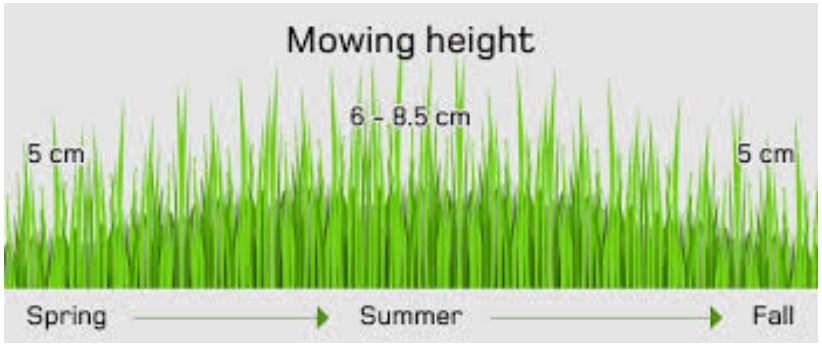
Organic Lawn Care is not just switching to organic fertilizers and pesticides—it's an approach to the whole system: the soil, the lawn and maintenance and even the client.

According to Chip Osborne of Osborne Organics, the steps for successful organic lawn care are:

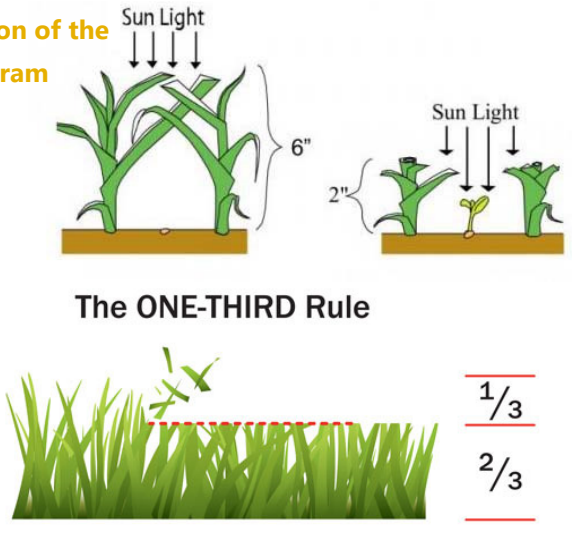
- Understand the client's needs.
- Determine the client's expectations for their lawn.
- Discuss organic lawn care confidently.
- Determine the physical, chemical, & biological characteristics of the site.
- Test the soil initially to determine appropriate input levels.
- Select grass seed suited to the site and manage existing grasses to their genetic requirements.
- Amend the soil to benefit turf grass.
- Employ proper horticultural practices: aeration, irrigation, and mowing.
- Minimize inputs by thinking in terms of less is more.

Keep grass seed on hand to spread on bare patches (above). Grass that is scalped can burn in the sun and allow weed seeds to germinate (below).

DIG DEEPER: See the NOFA Organic Lawn Care Guide, A Publication of the Northeast Organic Farming Association's Organic Land Care Program



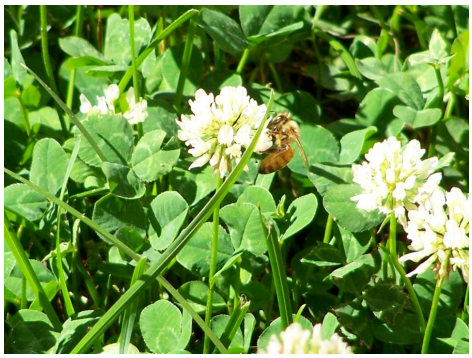
Mow the grass higher as the weather gets warmer & shorter again in the fall (above) and observe the one-third rule (right).



What do you look for in an employee? "Honesty is a top priority, including not inflating one's abilities & experience. Reliability—showing up every day on time. Being willing to learn—you don't need to know everything but knowing at least one thing well shows interest & willingness to learn. Being self-directed—don't just stand around waiting, ask someone what to do next. Working well with other people." –Paul Thompson, Thompson Organic Landscaping

Mowing Pitfalls:

Don't stress a lawn by scalping it or mowing it too short. This stunts the growth and root development of the grass while allowing weed seeds the sunlight to grow. Never remove more than one-third of the height of a grass blade at a time.



Clover adds nitrogen to the soil & flowers offer pollen & nectar for bees (top right). Allow grass clippings to remain on lawn for added nutrition & mulch (above).

Plant a seedling—here's how

A week or so before you are ready to transplant seedlings to garden, begin the process of "hardening off" to acclimate them to the outdoors. Put seedlings outside in a cold frame or other sheltered place for short periods of time, increasing the time over the course of the week. This lessens the shock of being planted & easily burned by the sun or dried out by the wind. To plant: 1. Make a hole twice as wide as the seedling root ball. 2. Gently pop seedling out of container. 3. Loosen roots if they look like they are holding the shape of the container. Place seedling in the hole so the garden soil is even with the soil in the container. (The exception is tomato seedlings which should be planted deep—at least to the first set of leaves.) 4. Gently tamp down soil around the plant & water in place.

VOCABULARY REVIEW

- ☐ Annual
- ☐ Self-sowing
- ☐ Perennial
- ☐ Biennial
- ☐ Tender perennial
- ☐ Dormancy
- ☐ Hand pruners
- ☐ Trowel
- ☐ Spade
- ☐ Action or stirrup hoe
- ☐ Germination
- ☐ Broadcasting seeds
- ☐ Biointensive planting
- ☐ Square foot gardening
- ☐ Soil pH
- ☐ Acidic soil
- ☐ Neutral soil
- ☐ Alkaline or basic soil
- ☐ Hardening off
- ☐ Organic
- ☐ Sustainability
- ☐ Permaculture
- ☐ Culinary herbs
- ☐ Seed dispersal
- ☐ Photosynthesis

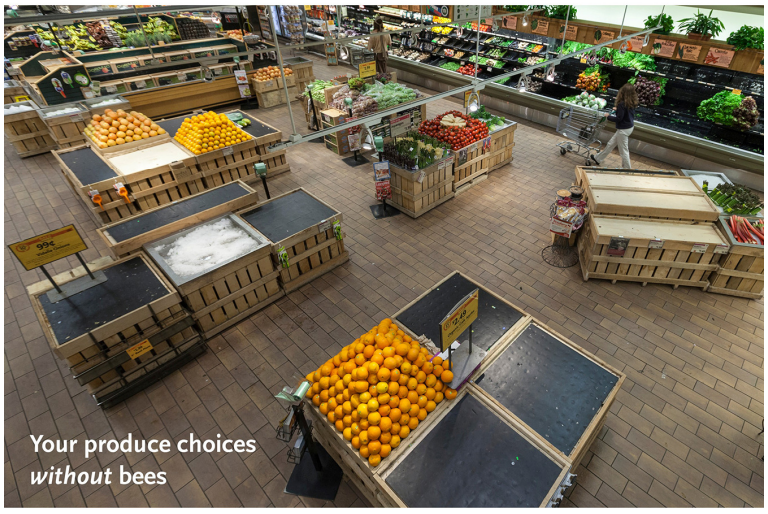
COLLABORATE—BE PART OF THE TEAM The ability to work well with others is something that employers will definitely be looking for. Working in a group is most effective and satisfying if team members observe some guidelines. Make sure everyone is on the same page—agree on goals and set expectations together. Put those team goals ahead of your personal achievement. Know your team—match the strengths of team members with the roles on the team. Be open minded to different opinions and ways of thinking. Remember that there is usually more than one way to look at an issue. Make sure everyone participates and recognize contributions from all members of the team. Keep communication open—be honest and address problems as they arise. Pull your weight on the team—everyone has a role to play.

Environmental Literacy: Pollinators & their Habitat

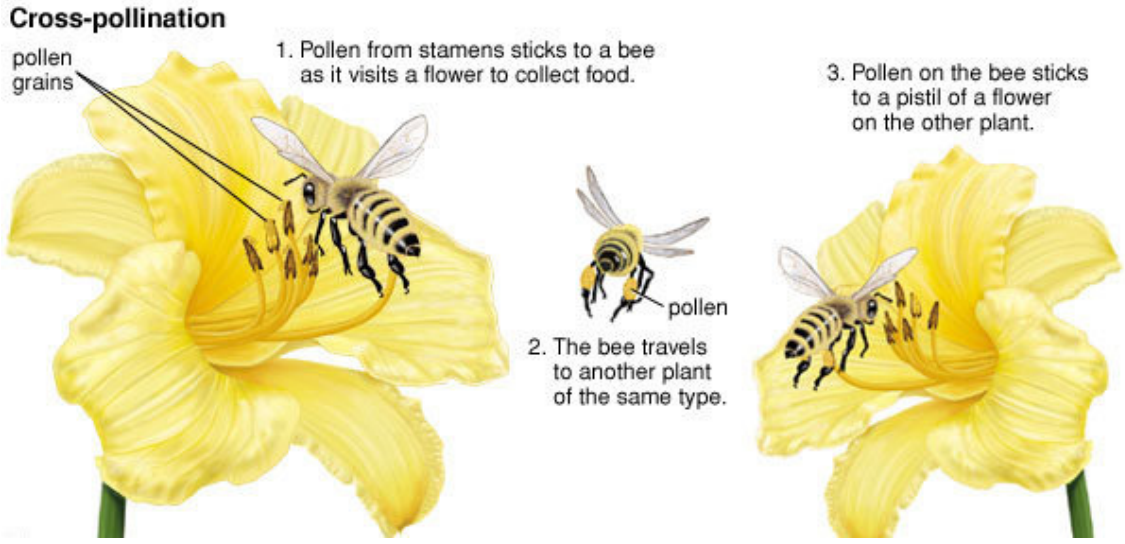
Pollinators, including butterflies, bees, moths, flies, hummingbirds, & bats, help many plants reproduce by transferring pollen from the male parts of the flower to the female parts. A large percentage of our food crops rely on pollinators for reproduction. According to the Natural Resources Defense Council, one of every three bites of the food we eat is pollinated by bees. Unfortunately pollinator habitat—the environment they rely on for food & shelter—is being impacted by development and other human activity. Gardeners can help preserve this critical habitat, but also create it. Support pollinators by planting productive plants that provide them with food and shelter.

DIG DEEPER: Learn more about plants that support pollinators in Appendix E.

Pollen clings to a bee collecting pollen in its pollen sacs.



A demonstration at the Providence Whole Foods store shows how bees critical for pollinating much of the food we eat.



Pollination is the process of transferring pollen from one flower to another for reproduction. Many flowers are pollinated by birds, bees and other insects. Some plants like corn and grasses are pollinated by the wind.

Native, Non-native & Invasive Plants

Plants can be categorized by their origins as native, non-native or invasive. Native plants were here before European settlers came and are well-adapted to the climate. Non-natives or exotics were brought from other lands but grow well here. Invasive plants are non-native plants that spread aggressively, taking over local ecosystems and crowding out the native plants. Invasives often get a foothold in disturbed soils. Being able to recognize these invasive plants & knowing how to remove them is an important skill in landscaping.

Example of a native: *Asclepias tuberosa*—Butterfly weed (food for the monarch)

Example of a non-native: *Ocimum basilicum*—Basil (culinary herb)

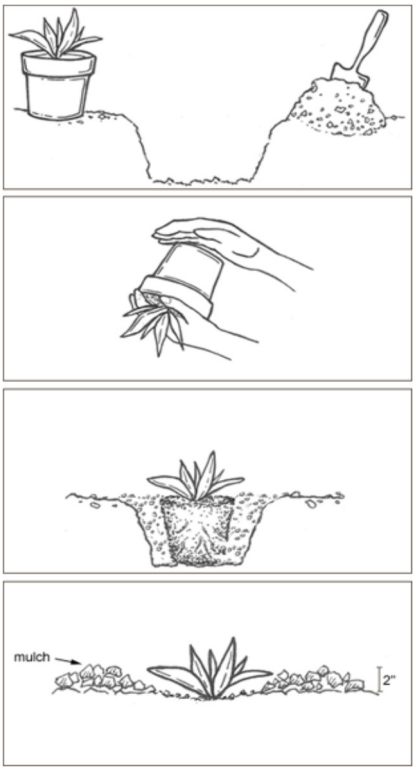
Example of an invasive: *Celastrus orbiculatus*—Bittersweet (chokes trees)

DIG DEEPER: Learn to identify invasive plants. See Appendix F.

IDENTIFYING POISON IVY Poison ivy is not an invasive plant—it's actually a native with wildlife value. You will likely encounter poison ivy so you should learn to ID & avoid it. Remember this saying:

Leaves of three, let it be.

Plant a perennial—here's how: Dig a hole the same depth & twice as wide as pot. Gently remove plant from pot & break up roots if plant is pot-bound. Put in hole. Refill gently with soil. Water & mulch.



What do you look for in an employee? *"I am interested in folks who enjoy the various pieces of their job. In my case that covers learning about products and gaining knowledge to help customers so I look for employees with curiosity and an interest in learning. And they have to like people—genuinely like the back-and-forth that a small, customer-focused setting demands. Willingness to learn probably tops all else for me—I don't expect (or necessarily want) an employee to come with all the skills they might need but their openness to acquisition of new skills is critical. Self-motivation is pretty key too—in small retail environments there is always something to do."*

Are there particular job skills that you would want employees to have that we could teach?

"Yes! math, manners with customers and great eye contact! Also, the ability to research anything, as in "I don't know the answer to that, but I can find out." Phone skills are important as well—how to handle the caller and when appropriate take a detailed message. Confidence with themselves and with the job." -Drake Patten, Cluck!

Technical Skills Focus: Landscape Maintenance

Landscape maintenance tasks vary based on the type of garden, the preference of the client, and the time of year. Common landscape maintenance skills include:

Edging: Create a clean line between a planted bed and a lawn for a neater appearance, to retain mulch, and to make it easier to mow.

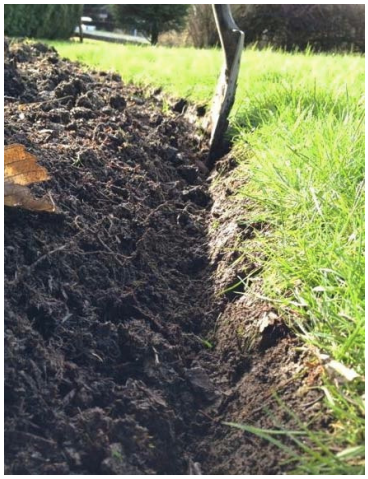
Cultivating & Fertilizing: Use a three-pronged cultivating tool to scratch or "cultivate" the soil around plants. This will remove encroaching roots from trees and as well as preparing the soil for an organic fertilizer.

Mulching: Mulch early in the season, after fertilizing but before weeds have grown in cleaned up garden. Keep mulch back from crowns of plants.

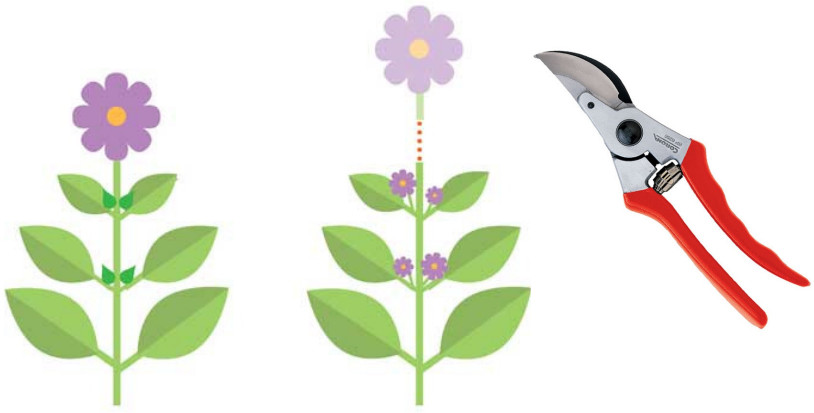
Using a hand cultivator

Deadheading: Remove dead flowers in order to encourage new growth and/or to neaten the appearance of the plant. Be strategic about which plants are deadheaded. Seed pods can be beautiful & provide birds with winter food.

Time of year is important. In the spring, clean-up garden beds, weed, edge beds, cultivate & fertilize & mulch, plant new perennials, shrubs & trees. It's also a good time for a "walk around" to consult with a client. In the summer, continue to weed & inspect garden, deadhead perennials, and prune shrubs that bloomed in the spring. In the fall, clean-up leaves, cut back some perennials, dig up dead annuals, continue to prune, fertilize & plant new perennials, shrubs & trees.



Use an edger (left) or a spade to edge a bed.



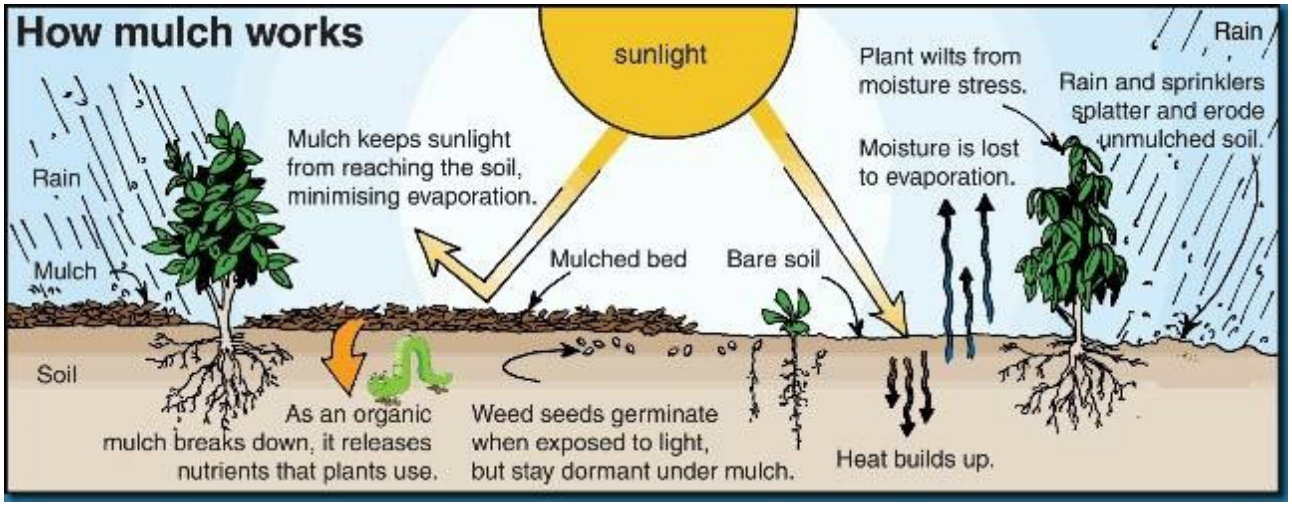
Deadheading flowers can encourage a plant to continue to bloom. Pinch or use hand pruners to cut off spent blooms.

What do you look for in an employee? *"The most important things I look for are reliability—showing up every day, being on time and being accountable for one's self, and being open and honest about how things are going. I look for someone who can make good eye contact, who understands the boundaries of the job when it comes to working on other people's property, who is interested in working hard and works well on a crew, someone who takes good direction and likes getting sweaty. All of the above are trainable and anyone who feels passionate about the work can learn and excel, but without the first one on the list, nothing can go forward."*
—Eugenie Najjar, Ground Flora Exterior Design

Mulching Pitfalls:

Avoid mounding mulch up around plants. Don't use new wood chips which compete with plants for nitrogen. Cocoa hull mulch is toxic to dogs. Plant densely to avoid a sea of mulch, & absolutely no ugly dyed red mulch!

Which type of mulch to use depends on many factors including client preference, appearance, cost, and availability. Straw (top right), shredded leaves (left), and bark mulch (center and right) are some of the types of mulch used in gardens.



GARDEN MATH—Calculating & Ordering Materials

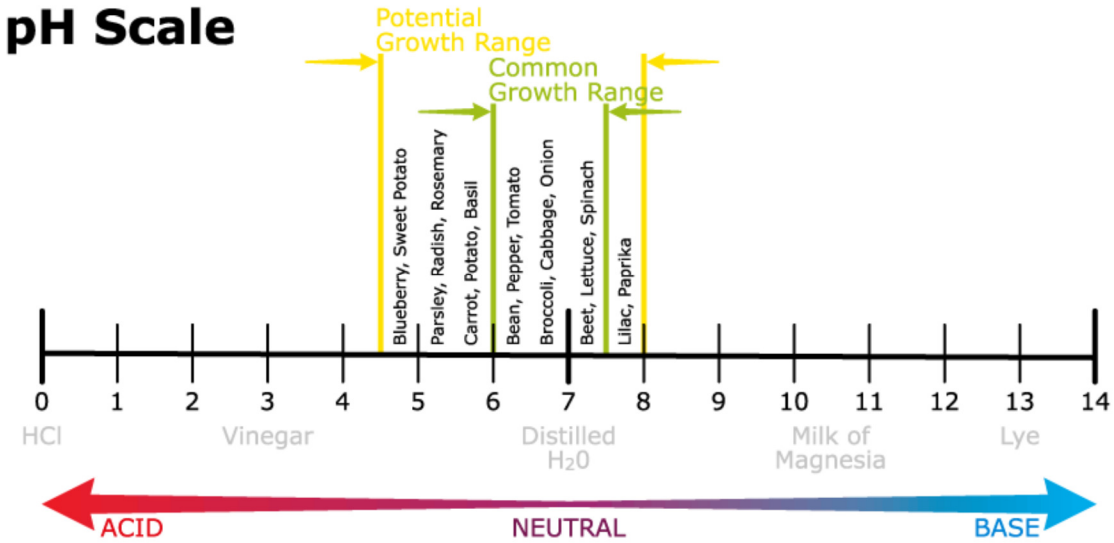
Ordering plants: Plants are sold in different sizes from flats to 4" containers to 3-gallon containers to balled & burlapped (B&B) root ball sizes to specified tree caliper sizes. Gallon sizes are written with the # sign, so a one-gallon pot will be listed as #1. Perennials are generally available in #1 containers. Shrubs and trees are often available in more than one size.

Ordering compost, mulch and other loose materials: Loose materials are sold in cubic yards so you will need to calculate how much to order based on the size of the garden space. For example, if you want to put 3" of compost on an 4' by 10' garden bed in the spring. First, calculate the area of the space you are applying the material: 4' x 10' = 40 sq ft. The convert the depth measurement from inches to feet: 3 inches divided by 12 inches or 3"/12" = .25'. Now, multiple the area by the depth to get the cubic feet. 40 sq ft x .25 ft ($40ft^2$ x .25') = 10 cu ft. Finally, divide cubic feet by 27 to convert to cubic yards. So, 10 cu ft / 27 = .37 cubic yards or cy. For this small amount, you could buy bagged compost, but if you have 10 garden beds, you would order 3.7 cy (or round up to 4 cy).

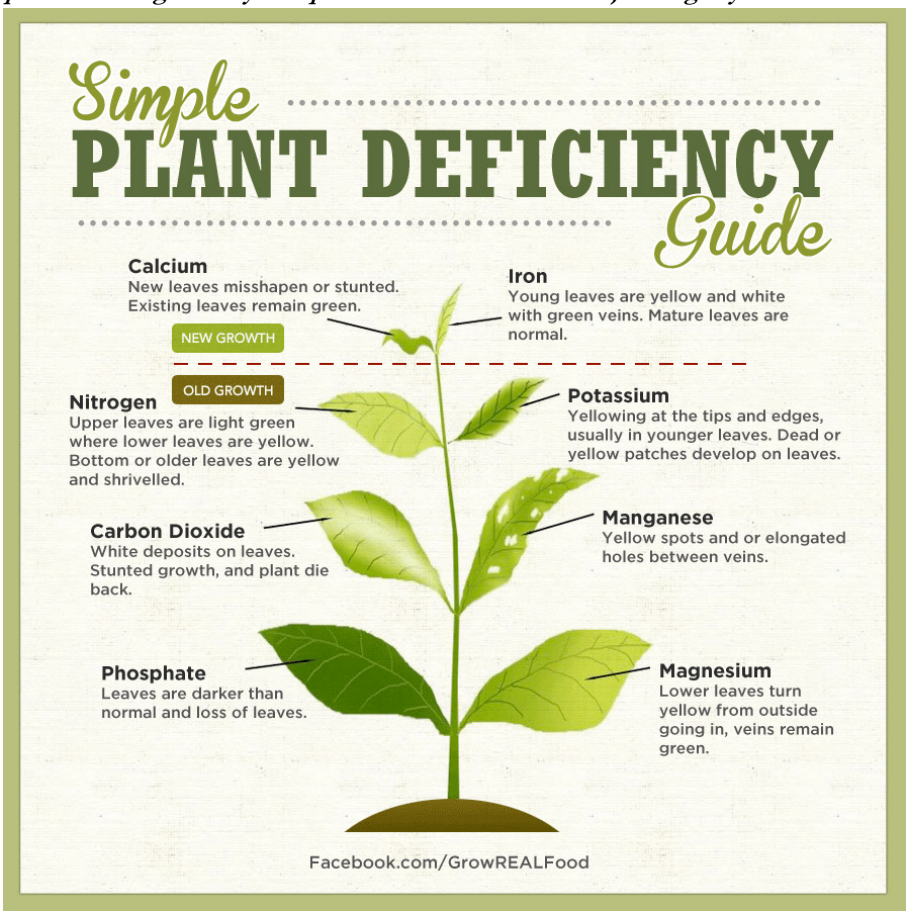
DIG DEEPER: See Appendix I for more calculations and an example of a cost estimate.

Technical Skill Focus: Interpreting a Soil Test

The soil report will provide recommendations for adjusting soil pH based on what you are trying to grow. Since the soils in RI tend to be acidic, you may need to add limestone increase the pH level. If your soil is deficient in any nutrients, the report will offer suggestions for fertilizer and/or other amendments. The three numbers on bags of fertilizer "N-P-K" indicate how much nitrogen (N), phosphorus (P) & potassium (K) are in the fertilizer. If the percentage of organic matter is lower than the desired range, add compost to the soil.



When soil is at the optimal pH level for the plant, the nutrients in the soil are available to the plant. Plants generally like pH levels between 6 to 7—just slightly acidic to neutral.



Test and improve the Soil pH

Soil Test Reading	What You Must Do
High pH	The soil is alkaline. Lower the pH by adding sulfur, gypsum, or cottonseed meal.
Low pH	The soil is too acidic. Add lime or wood ashes.
Low Nitrogen	Add manure, dried blood, fish meal or hoof meal.
High Nitrogen	Soil may be over-fertilized. Water soil and do not add more fertilizer.
Low Phosphorus	Add bonemeal, dried blood, fish meal or rock phosphate.
High Phosphorus	Soil may be over-fertilized. Grow more plants to use up the excess.
Low potassium	Add potash, wood ashes, fish meal, dried seaweed or cottonseed meal.
High potassium	Continue to fertilize with nitrogen snd phosphorous-rich soil additions.
Poor Drainage or Too Much Drainage	If the soil is heavy or clay-like it won't drain. Mix in peat moss or compost to achieve a better texture for your soil.

Make sure the soil pH level is appropriate for what you want to grow & soil nutrient levels are sufficient for plant health.

Organic Materials Review Institutes OMRI-approved soil amendments include limestone, blood meal (12-0-0), bone meal (4-12-0), and fish emulsion (2-4-1), (above). Soil test results (below).

SAMPLE ID: MORAN

RECOMMENDATIONS FOR HOME GARDENS:

SOIL PH ADJUSTMENT:
INCORPORATE 15 lbs of ground dolomitic (magnesium rich) limestone per 100 sq ft as early as possible prior to planting. Avoid mixing in lime when the soil is very wet.

FERTILIZER:
** Your soil contains sufficient levels of potassium. You may apply the standard recommendations below, or you may provide sufficient nitrogen and phosphorus by using alternate sources to provide about 1/4 lb nitrogen and about 1/4 lb phosphorus per 100 sq ft.

** VEGETABLES: Apply 3-4 lbs 5-10-5 per 100 sq ft in early spring.

** ANNUAL FLOWERS: Apply 1.5 lbs 5-10-5 per 100 sq ft in early spring. Alternatively you may use one-half the ORGANIC recommendation given above.

** ROSE BUSHES: Apply 4 tablespoons of 5-10-5 per bush in early June and early August. None after August 15.

Avoid overfertilizing which can cause plant toxicity and can contribute to insect and disease problems.

MICRONUTRIENT		PPM	SOIL RANGE	MICRONUTRIENT		PPM	SOIL RANGE
Boron	(B)	0.2	0.1-2.0	Copper	(Cu)	0.2	0.3-8.0
Manganese	(Mn)	2.0	3 - 20	Iron	(Fe)	14.0	1.0- 40
Zinc	(Zn)	1.7	0.1- 70	Sulfur	(S)	9.3	1.0- 40

SOIL pH 6.0
BUFFER pH 6.5 ORGANIC MATTER: 5.0 % (Desirable range 4-10%)

NUTRIENT LEVELS:		PPM	Low Medium High Very High
Phosphorus	(P)	8	XXXXXXXXXXX
Potassium	(K)	168	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
Calcium	(Ca)	815	XXXXXXXXXXXXXXXXXXXXXXXXX
Magnesium	(Mg)	86	XXXXXXXXXXXXXXXXXXX

CATION EXCH CAP	PERCENT BASE SATURATION	MICRONUTRIENT LEVELS
10.5 Meq/100g	K= 4.2 Mg= 6.8 Ca=39.1	ALL NORMAL

EXTRACTABLE ALUMINUM: 67 ppm (Soil range: 10-250 ppm)

The lead level in this soil is low.

A soil test report can be tricky to interpret because it contains so much information. Three important areas of the soil test report are the soil pH level, nutrient levels and the percentage of organic matter in the soil. Go through the information step-by-step to determine how to implement the recommendations.

CALCULATING SOIL AMENDMENTS Directions for applying soil amendments will be in terms of lbs per 100 sq ft, so you will have to determine how much you need based on the area of your garden. Find the area of your garden in sq ft and divide by 100. Multiply this number by the amount in lbs recommended per 100 sq ft and this is how much in lbs you should apply to your garden.

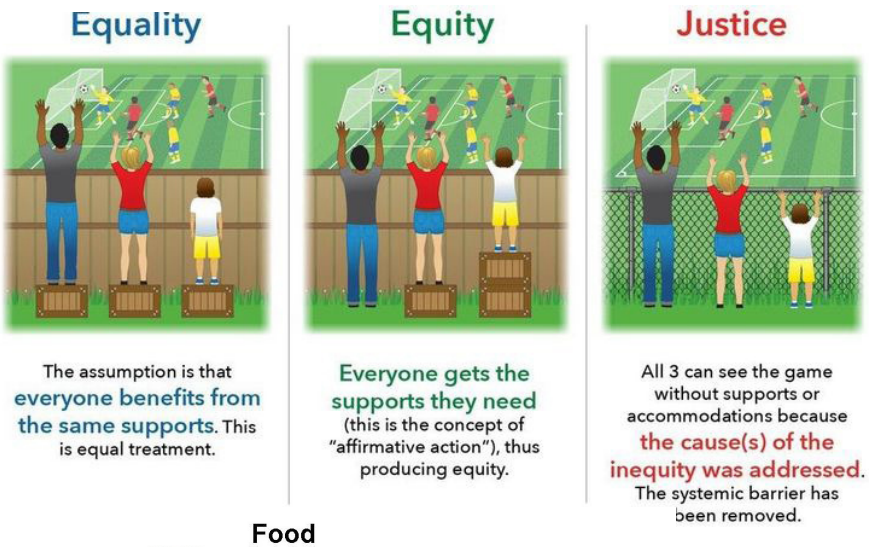
Environmental Literacy: Food Justice

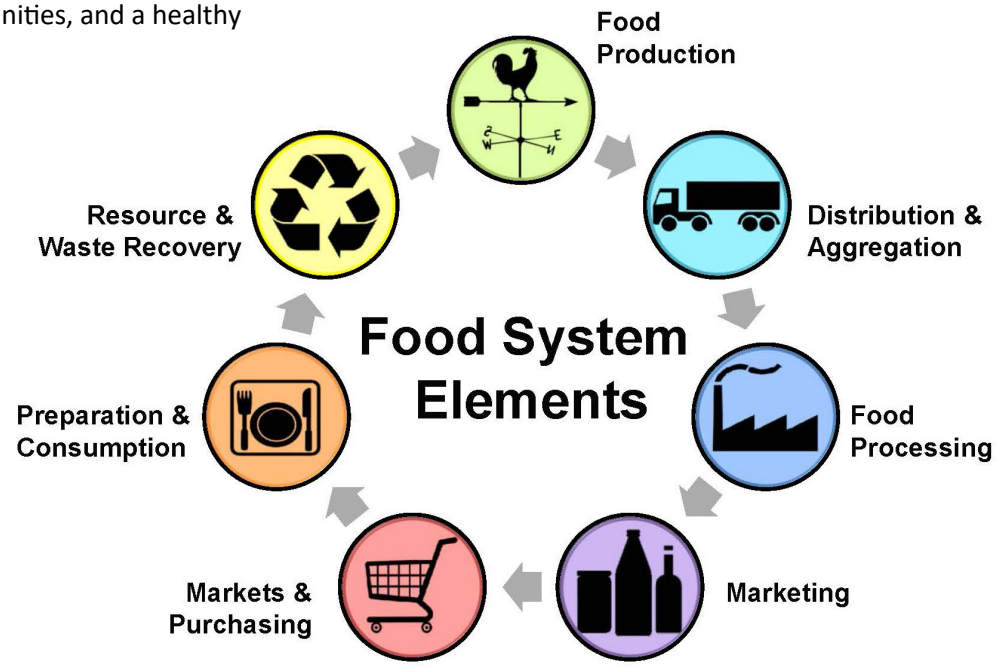
Reprinted from Just Food (justfood.org/advocacy/what-is-food-justice)

"Food Justice is communities exercising their right to grow, sell, and eat healthy food.

Healthy food is fresh, nutritious, affordable, culturally-appropriate, and grown locally with care for the well-being of the land, workers, and animals.

People practicing food justice leads to a strong local food system, self-reliant communities, and a healthy environment."





Decisions are made at each point in the food system (above). The distinction between equality, equity & justice (top right).

What do you look for in an employee? *"For our work, I typically look for someone who is interested in the mission of the organization, is able to be flexible, and values feedback and professional growth. Being able to connect to the mission always feels like an important way to ground all employees in our collective work together. Flexibility is always key, as we work in a fast paced environment where factors change often (ex: weather, customer needs, timing, etc.), and being able to function in an environment like that is typically key to an employee's success. At Farm Fresh, and actually every place I've worked, there's been a commitment to ongoing professional growth and development; it's important to hire folks who want to continue to grow professionally and do the best they can for themselves and the organization."* —Sarah Bernstein, Farm Fresh RI

"What I can add about our operations positions such as Drivers, Delivery Assistants, and Packhouse Associates is that we're often looking for both the technical skills needed to do the job (such as DOT certifications for drivers), but also the ability to be outward facing and put on a "customer service cap" where necessary. Across the board we seek candidates who show a strong commitment to collaborative problem solving. Sarah outlined some of the more liquid aspects of our operations work (time sensitivities, weather, customer needs, etc.) and we are often finding ourselves looking at unique circumstances requiring unique solutions. These solutions rely on informed contributions from multiple roles across the team. The ability to work together, troubleshooting and brainstorming, is paramount." —Dave Johnson, Farm Fresh RI

Get Set for Employment—Write a Mini-Resume or JIST Card

Reprinted from Jails to Jobs:
https://www.jailstojobs.org/instead-of-resume-use-this-to-hide-gaps-and-highlight-strengths/

If you have gaps in your work history or if you want to set yourself apart from other job seekers, think about creating a JIST card and using it instead of a resume. JIST stands for Job Information Seeking and Training and was coined by Michael Farr, a career expert and author. He also came up with the idea of the JIST card, which is like a mini-resume, and you can use it to highlight your strengths without including any information that might be detrimental to your job search.

A JIST card basically includes your name, contact information and a summary of your experience in a paragraph. You can use this paragraph to highlight the work you've done and the skills you've developed. Since there is no list of the jobs you have held, a JIST card doesn't show any periods that you weren't working or even the names of the companies you worked for. The beauty of a JIST card is that not only is it unique, but it also has nothing that can be perceived of as negative, and you can send them out with a cover letter instead of a resume.

Like a resume, a JIST card is just a key to open the door to a face-of-face meeting or interview and in many ways might do it better than a resume. According to some studies, resumes only get a cursory glance of a few seconds each, which is hardly enough time to really see what a job applicant has to offer. In the same amount time, a hiring manager can see a snapshot of what you have accomplished from a JIST card.

In order to create a JIST card, sit down for a brainstorming session and write down your best examples of job experience and skills. Then write up a paragraph describing them, as in the example below. Since your JIST card is just a quick summary, be sure to only focus on the things that you think the hiring managers will find most impressive.

Although there are different layout styles for JIST cards, here's what the text of one could look like:

Jack Pierson

Position: Carpenter's assistant

Phone: (xxx) 825-3765

Email: jpierson339@wherever.com

Four years of experience in a variety of home construction and remodeling projects, including window and door framing, cabinet work and appliance installation in projects that included kitchens and bathrooms. Experience with a wide range of hand and power tools, skilled in reading blueprints, able to communicate effectively and an excellent problem solver.

Hard working, reliable, honest and cheerful.

TAKE INITIATIVE—BE AN ENTREPRENEUR! Once you have increased your knowledge and honed your skills through continuing education, volunteering, apprenticeships, and work experience, consider starting your own business. Many of the job fields related to landscaping & agriculture lend themselves to individuals going out on their own and being self-employed. Look for classes or business incubators to learn the basics of running your own business.

Technical Skill Focus: Weeding

Recognizing common weeds and knowing how to deal with them is a valuable skill in both landscaping and agriculture.

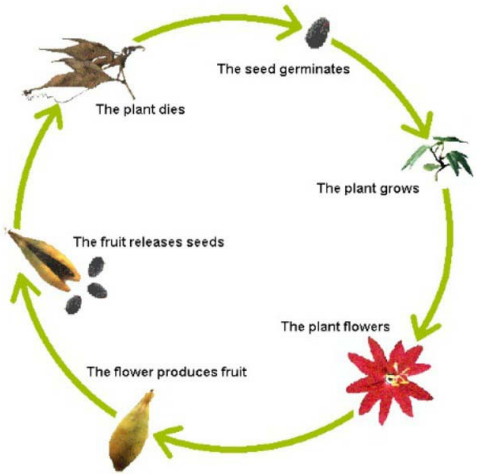
Just like any plant, weeds have life cycles, spread their seeds and make energy through photosynthesis. These concepts help explain the best timing and methods for weeding. Knowing the life cycle of a weed and the ways it spreads its seeds helps explain why pulling weeds before they set seeds will reduce reseeding and cut down on future weeding. Photosynthesis helps explain why cutting back or mowing perennial weeds over and over weakens them.

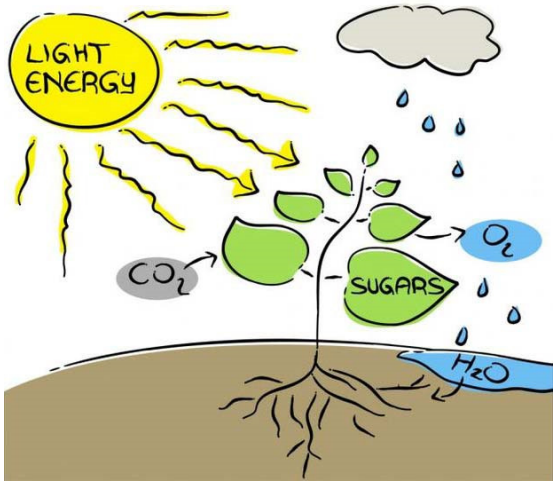
Some weeds can be easily removed by hand; others have a deep taproot that must be dug out with a weeding knife. A stirrup hoe is a good tool for a garden bed with weed seedlings. Other weeds spread through underground rhizomes. Be careful using organic herbicides which may be natural but can still be toxic.

DIG DEEPER: Learn to identify common weeds in Appendix C.

Seed dispersal helps explain how some weeds spread.

Other weeds spread by underground rhizomes.





Review the lifecycle of a plant (top) & the process of photosynthesis (above)

A weeding knife & a stirrup hoe are useful tools.

Introduction to Medicinal Herbs

Herbs have been used to support health for centuries. They can made into teas, decoctions, tinctures or salves. You can use the leaf, root, or flower, fresh or dried. Many herbs are both medicinal & culinary including rosemary, sage, thyme, mint, dill, lavender, lovage & lemon balm. Some weeds have medicinal properties including dandelion, purslane, & plantain.

To make tea, steep fresh or dried herbs in hot water for 5 minutes.

DIG DEEPER: Learn to identify these herbs and how they support health.

CHAMOMILE (Roman)
Chamaemelum nobile
Self-sowing annual

FEVER FEW
Tanacetum parthenium
Perennial, spreads

NETTLE
Urtica dioica
Perennial, spreads

LAVENDER
Lavandula officinalis
Perennial

COMFREY
Symphytum officinale
Perennial

ANISE HYSSOP
Agastache foeniculum
Perennial

PEPPERMINT
Mentha pipertia
Perennial, spreads

LEMON BALM
Melissa officinalis
Perennial, spreads

HOLY BASIL
Ocimum tenuiflorum
Grown as an annual

CALENDULA
Calendula officinalis
Grown as an annual

LEMON VERBENA
Aloysia citrodora
Tender perennial

BORAGE
Borago officinalis
Annual, spreads

What do you look for in an employee? *"Our workers have a commitment not only showing up on time and working hard, but continuing their education on health and herbs. We do require our students to have Level 1 & 2 Herbal Education certificates. Because our work is so detailed and health related, our employees are have an understanding of herbs & plants that grow in our bio-region and understand the importance of nutritional healing. All of our employees have gone through the training programs that we provide in the field of organic farming, herbalism and nutritional healing."* -Mary Blue, Farmacy Herbs

Technical Skills Focus: Harvesting

Harvesting zucchini with a knife

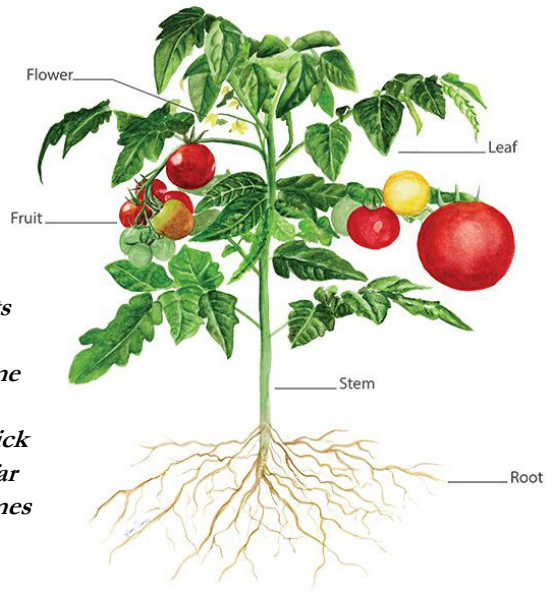
It is important to pick fruits & vegetables at peak "ripeness" for the best flavor & nutrition, but "ripe" can mean different things for different plants. For some, color is the best indicator for ripeness (ex. strawberry), while size matters most for others (ex. eggplant). Some vegetables taste best at their young, more tender stage (ex. salad greens like arugula).

Different crops require different tools for harvesting. For many plants a sharp knife is helpful (ex. zucchini, cabbage, broccoli, salad greens), while other times a broad fork (ex. carrots, potatoes) may be necessary. Sometimes all you need are clean hands (ex. tomato, berries, beans, radishes). In any case, it is important to treat both the plant and the harvested portion with care so as not to damage the crop.

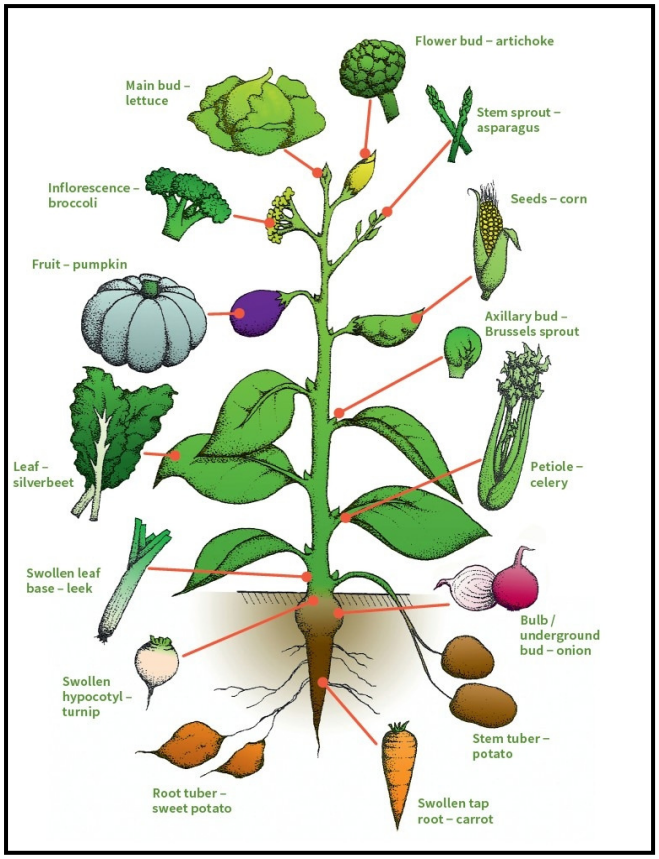
To sell produce to any purchaser, it must be clean, dry, and packed in uniform quantities. Depending on the crop and purchaser, produce can be packed by the piece, by the bunch or bag, by the lb., or by the case. A scale, rubber bands or twist ties, clear plastic bags, or waxed produce boxes of various sizes can all be helpful during the packing process. If packing large quantities, it can be helpful to keep a tally as you go of how many bunches, bags, etc. you have done.

Depending on the crop and farming practices (i.e. pesticide use), washing can be as simple as dunking and agitating the crop in cool water immediately after harvest. In the summer, it is important to cool the produce as quickly as possible to avoid wilting and quality degradation associated with extended periods of heat (especially for leafy greens). It is important to use clean water for washing, and to ensure that produce is dry before packing (ex. use a salad spinner to dry leafy greens so that they last longer in plastic bags). For crops that are in contact with the soil, it may be necessary to soak or scrub the dirt before the produce is marketable (ex. carrots).

Most crops should be stored in a cooler or refrigerator to maintain quality post-harvest.



Review the parts of the a plant (right) & become familiar with which part to pick for each crop (far right). Sometimes more than one part is edible.



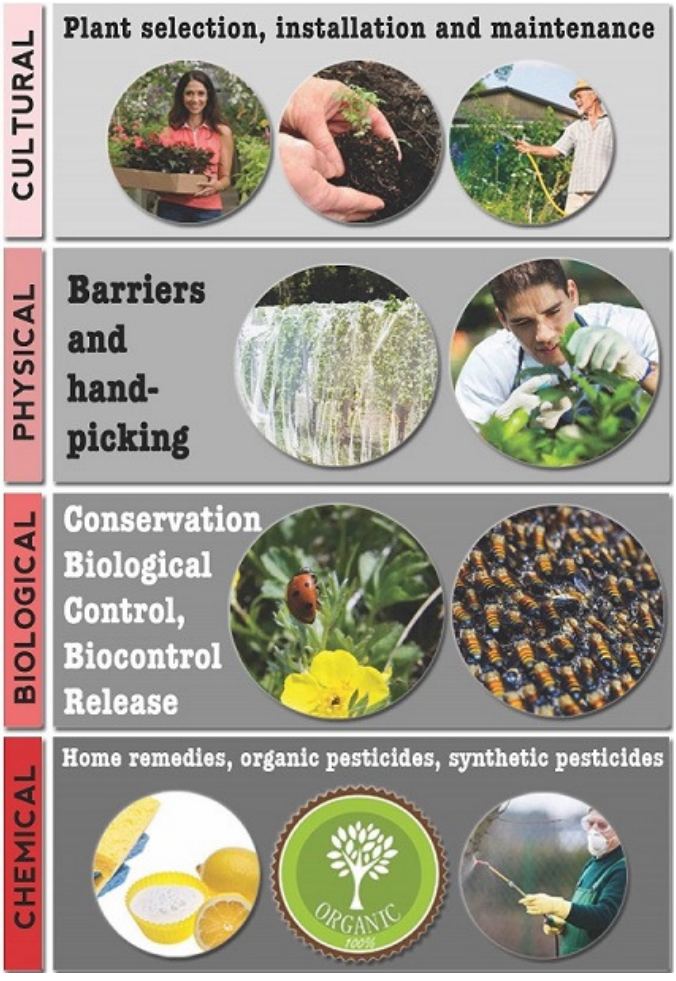
GET ORGANIZED—MAKE A LIST! Whether you are searching for a job or juggling family obligations, life can seem overwhelming. Being organized is essential to staying on track. A to-do list is a tool help you identify and focus on your priorities and the steps to make them happen. Start by writing down what needs to be done today or this week and what can wait until sometime in the future. Getting it down on paper helps clear your mind. You also get the satisfaction of crossing off items as you complete them.

Introduction to Organic Pest Control

Being able to identify insects as beneficial insects or "pests" (good or bad) is an important skill.

Inspect plants regularly for signs of pest damage—holes in leaves, eggs, or the insects themselves. Insects become pests when they occur in quantities to damage crops or plants. Commercial growers may have less tolerance for pests than the home gardener. Use preventative measures when possible. If you do have pests, start with the least invasive remedy for control.

DIG DEEPER: Learn to recognize common garden pests.



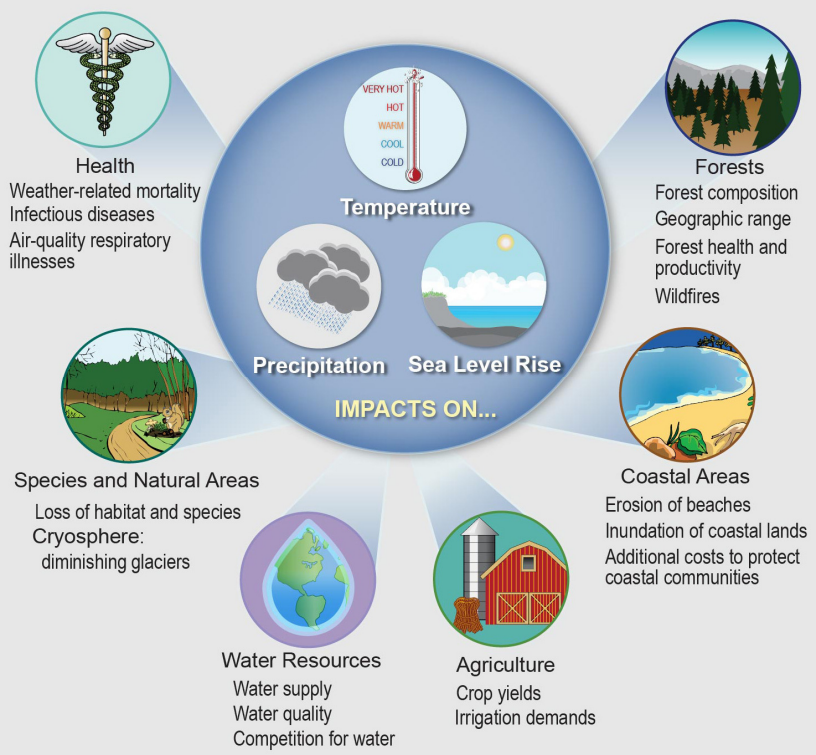
The components of Integrated Pest Management (IPM) and organic pest control (left) and common garden pests (right).

WHAT'S YOUR PROBLEM?—AN APPROACH TO PROBLEM SOLVING Problem solving is the process of systematically working through the details of an issue to find the best solution. The first step is to define the problem. Look beyond the symptoms to identify the actual problem and the root causes of the problem. Then start to brainstorm & generate options for solutions. Ask questions. Be creative—this is when you should "think outside the box". Don't be critical of any ideas at this stage. Once you have a list of possible solutions, evaluate the pros & cons of each to determine the best course of action. Complicated problems may seem insurmountable, but break them into smaller pieces. And give yourself time—sometimes the best answer will come after you have "slept on it" or taken a break from thinking about it.

Environmental Literacy: Climate Change

Reprinted from the US Global Change Research Program, https://www.globalchange.gov/climate-change

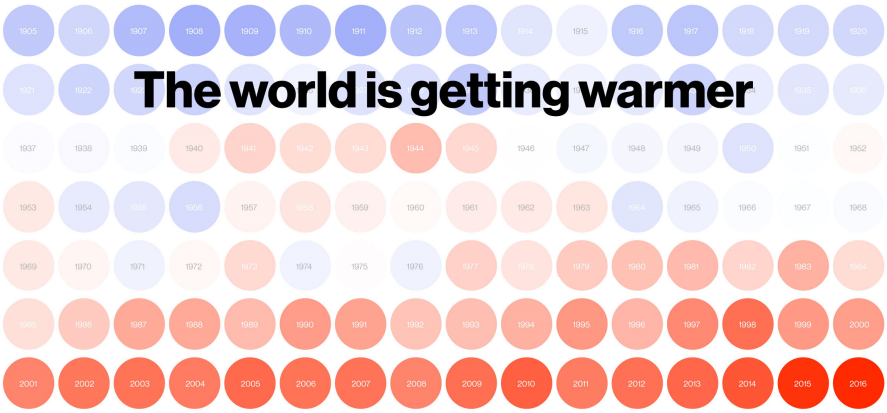
Evidence from the top of the atmosphere to the depths of the oceans, collected by scientists and engineers from around the world, tells an unambiguous story: the planet is warming, and over the last half century, this warming has been driven primarily by human activity—predominantly the burning of fossil fuels.

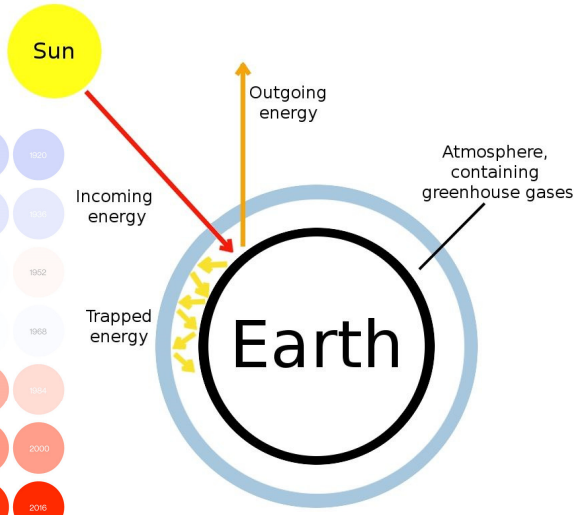


The potential effects of climate change include impacts on natural resources, economic sectors & human health.

Climate change is affecting the American people in far-reaching ways. Impacts related to climate change are evident across regions and in many sectors important to society—such as human health, agriculture and food security, water supply, transportation, energy, ecosystems, and others—and are expected to become increasingly disruptive throughout this century and beyond.

As the impacts of climate change become more prevalent, Americans face decisions about how to plan and respond. Using scientific information to prepare for climate change can create economic opportunities, and proactively managing the risks can reduce impacts and costs over time.





Average temperatures from the years 1905 to 2016 show the alarming warming of the planet in recent decades (above left). Greenhouse gases in the earth's atmosphere trap heat and increase the earth's temperature (above right).

REGISTER TO VOTE! In a democracy, voting is not just a right—it is a responsibility. In Rhode Island voting rights were restored to formerly incarcerated citizens in 2006: "A person who has lost the right of suffrage under Article II, Section 1 of the Constitution of Rhode Island because of such person's incarceration upon a felony conviction shall be restored the right to vote when that person is discharged from incarceration." - (The Rhode Island Restoration of Voting Rights Act, SECTION 17-9.2-3)
It's easy to feel discouraged about politics but there is too much at stake, so get out there and vote!

Get Set for Employment: Tips for Interviewing

Reprinted from Jails to Jobs: https://www.jailstojobs.org/interview-tips/

In preparing for an interview, begin by thinking about a time when you felt most secure and at the top of your game, or imagine what that might feel like. Get in the mindset that you are an excellent candidate for the job and will get it.

Always begin the interview by thanking the interviewer for the opportunity to be interviewed. Politeness opens a lot of doors.

Provide short answers to hard questions and long answers to easy questions. Focus more time on the things you want to talk about.

Prepare and practice answers for tough questions you think they might ask.

Steer the conversation to what your strengths are.

Come prepared with questions, such as "Why did the person who had this job before leave? What in the end is most crucial for you (my boss) to be happy with me if I get this job? What would you like me to accomplish in the first couple of weeks on the job?" It's extremely important to keep in mind that the words you use are just a small part of the way you communicate. It is said that the impression you make is based just 7% on the actual words you use and 38% on the tone, pitch, volume and rate of your speech and 55% on your body posture, clothing, facial expressions and gestures.

Dealing with your record during the interview Be honest. Most employers run background checks and are going to find out about your past, so you do not want to take the risk of getting fired by lying. On the application answer any questions regarding convictions with "will explain in interview." It is also a good idea to rehearse what you are going to say beforehand. Be brief and concise by spending just a minute on the subject. Have good eye contact with the hiring manager and a sense of openness, compassion, and peace. This energy can be picked up. Remember to smile regularly during the interview.

Larry Robbin, a nationally-known expert in the area of workforce development, advises ex-offenders to give what he calls a "turnaround talk," which means to be honest and tell that you've been in jail or prison but also explain what you have done to turn your life around. This talk is designed to turn the employer's way of thinking around, so he or she will understand where you're coming from, and be empathetic to your situation—and, hopefully, ultimately offer you a job. You must practice this talk so you can deliver it well and with sincerity. It should never sound rehearsed or canned.

Many employers are willing to give someone a chance but don't get too invested in any one potential job. If that employer does not want you, it is the wrong employer. The right employer will say yes!

Robbin also recommends putting together a turnaround packet, which may contain:

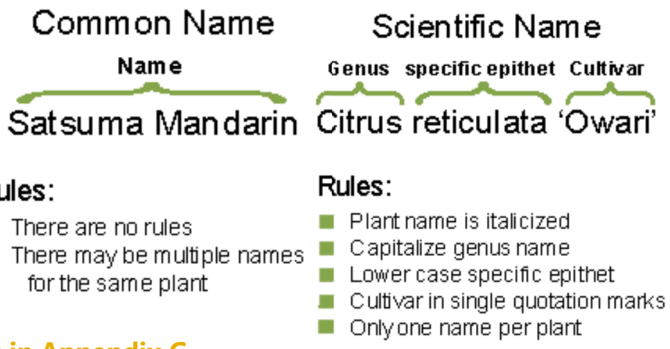
- Any training, schooling or DEUCE (or other institutional substance abuse treatment program) certificates.
- Letters of reference.
- Letters about any volunteer work you may have done.
- Clean print out from DMV if available.
- Pictures of accomplishments.
- Papers stating honorable or general discharge from military, if applicable.
- Evidence of enrollment in GED or Adult Education.
- Letters of recommendation from former employers even if before incarceration.
- Evidence that can be shared that demonstrates that you have turned your life around and your incarceration experience has turned out to be a strength and character builder.

****And ALWAYS follow up after the interview with a thank you card, thank you email or both!****

TAKE CARE OF YOURSELF! Having a positive outlook on life is important especially when you are looking for a job. Remember to take care of your physical & mental health: eat well, exercise, & get enough sleep.

Botanical Nomenclature

Plants can have multiple common names or be called different names in different regions. Using a plant's Latin botanical or scientific name (including genus, species and variety) will eliminate confusion, even across different languages. Botanical names can also reveal clues about the plants they describe.

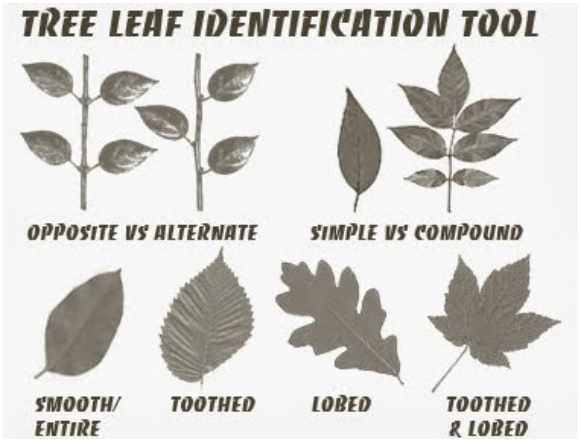


DIG DEEPER: Learn the meaning of many botanical names in Appendix G.

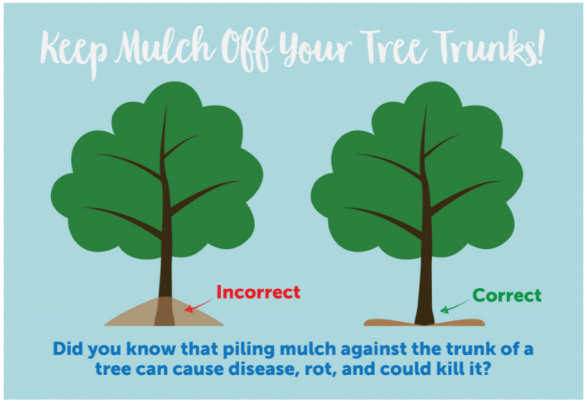
Trees & Shrubs

Trees and shrubs provide shade and structure in the garden, food and shelter for wildlife, and food and other products for humans. As with any plant, look up the conditions it requires so you plant it in the right place. Knowledge of tree & shrub species is essential for landscapers, arborists, nursery workers and orchard farmers. Learn to identify trees using a dichotomous key which walks through a series of questions about tree characteristics to narrow the choices and figure out the name of the tree.

DIG DEEPER: Learn common trees & shrubs in Appendix H.



Learn the terminology used to describe leaf shape and configuration and branching patterns.



Avoid making mulch volcanos around trees.

VOLUNTEER! Volunteering is a great way to gain experience, meet new contacts and contribute to your community. Many organizations have a volunteer program in place. Sign up to help with Southside Community Land Trust's plant sale in May. Assist in Farm Fresh Rhode Island's packing room. Ask if the organization you are interested in would consider taking volunteers, then visit to make sure it's a good fit. Volunteering might lead to a job especially if you show a potential employer what a hard worker you are. Maybe your volunteer supervisor will be willing to give you a letter of recommendation. In any case, the hands-on learning experience and the sense of satisfaction will make it worth your time and effort.

Technical Skill Focus: Basic Pruning

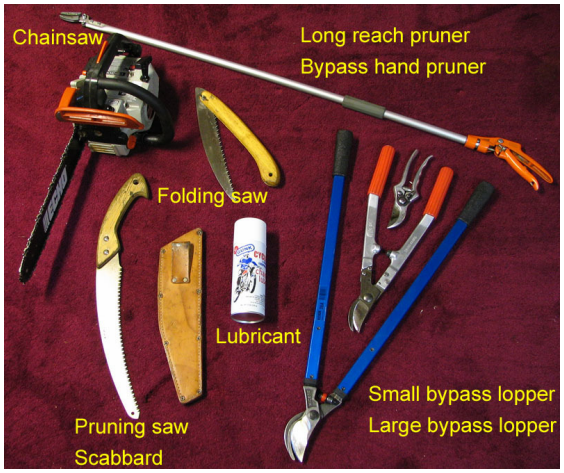
Why? Prune to remove dead or diseased branches, to correct the structure of the tree, to reduce long or overextended/heavy limbs, to thin branches so light can get in, and to encourage new growth and bloom. Start pruning while trees are young to encourage good mature form.

When? It depends on the plant. It's important to get the timing right. Generally, trees that bloom in the spring should be pruned after they bloom while trees that bloom later should be pruned in winter or early spring when they are still dormant.

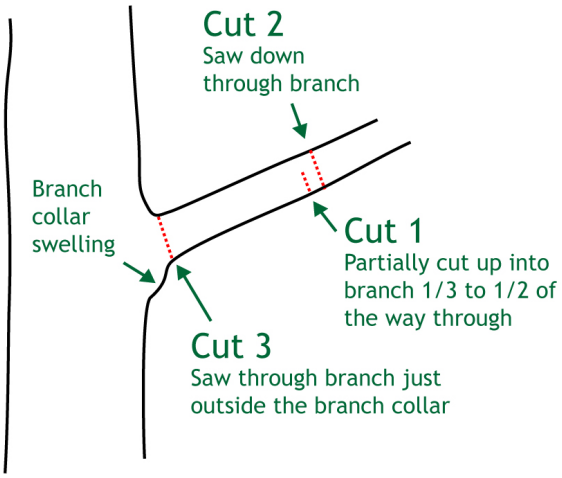
How? Pruning takes time to master but start with the basics. Use clean tools. Be strategic and patient. Learn to cut branches in the right place. Use common sense when climbing ladders or working near wires.

DIG DEEPER: See the Arborists' Certification Study Guide by the International Society of Arboriculture.

Climbing is part of the job for an arborist or tree company employee.



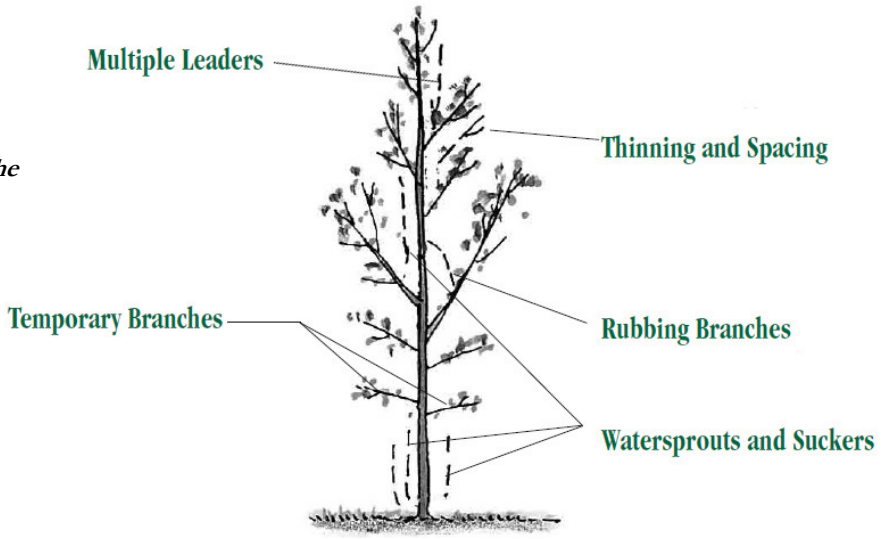
Clean tools after pruning to avoid spreading disease.



Cut outside the swollen area at the base of the branch for proper healing.

Pruning Pitfalls:

Don't leave branch stubs which will encourage disease and rot. Never prune by "topping" trees. Understand the timing of bloom before you prune. Don't make shrubs into meatballs. Be safe!



Corrective pruning can improve the form of a tree.

What do you look for in an employee? *"Attitude, attitude, attitude. Good attitude outweighs lack of skill every time. A good attitude allows for humility, the ability to learn and set one's ego aside. It's just like pro athletes... I'll take the guy/gal that works hard and wants to apply themselves over the guy/gal that's insanely talented and thinks they're already at the top of the mountain every time. Some familiarity with pruning and plant ID is helpful, but common sense and teamwork are more important to me."* -Tom Morra, TF Morra Tree Care

Fall Maintenance & Planting

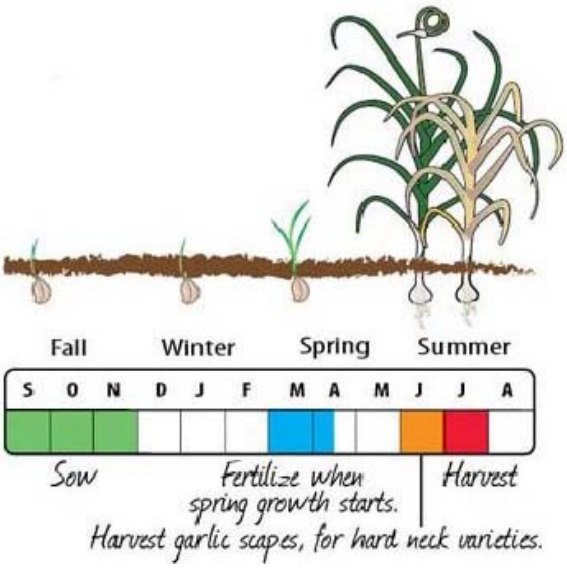
As the end of the year approaches, there is still plenty to do in the garden.

Plant garlic in October or November. Cover with a deep layer of straw for the winter. It will start to grow over the winter and be ready to harvest in the summer.

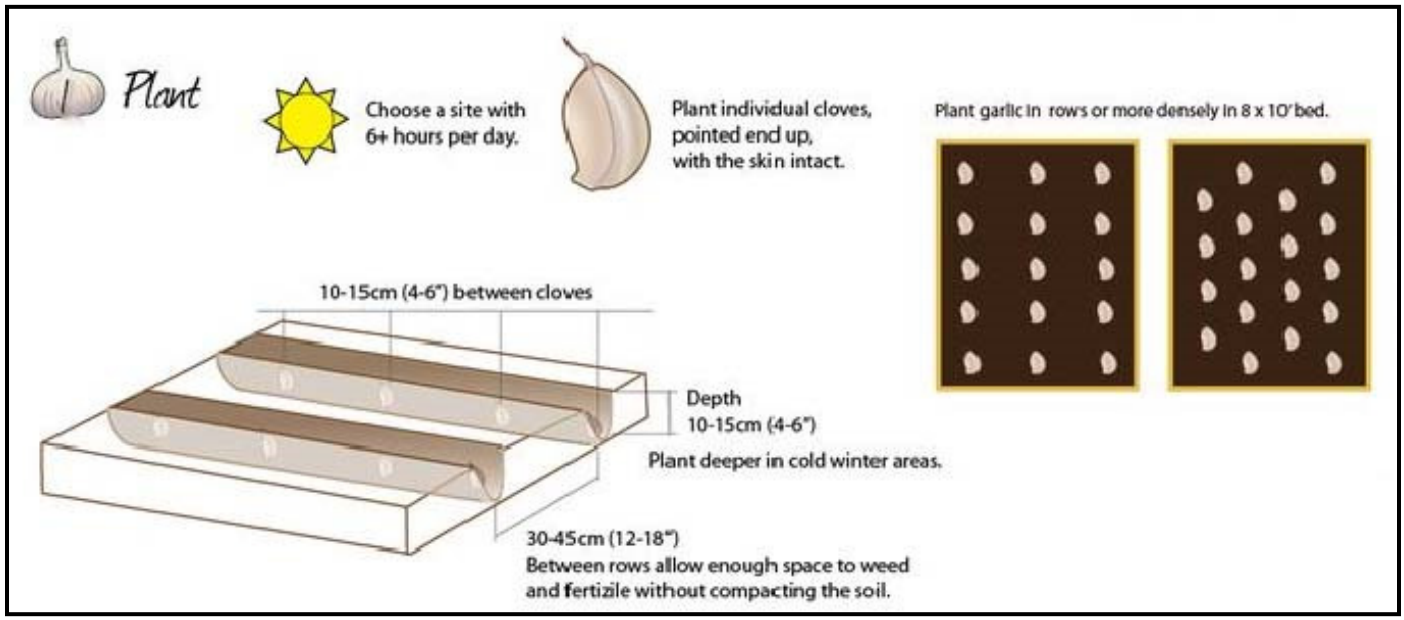
Plant cover crop or "green manure" to replenish the soil after a season of growing and to prevent erosion of garden soil. In the spring, turn cover crop into the garden bed to add nitrogen to the soil. If it is too late in the season to plant cover crop, cover beds with 2-6" of shredded leaves in the fall and turn under in the spring to feed the soil.

When it's time to clean up the perennial garden, consider leaving the dried flower stalks. Birds eat the seeds over the winter.

Cover crop seed mix (left) & growing in the spring (right).



Leave dried stalks on perennials to feed birds through the winter.



Plant individual cloves of garlic with their skins still on, pointy end up 4-6" deep and apart. Cover with straw mulch.

What do you look for in an employee? "I am looking for a person who can show up on time and be ready to work, a person who demonstrates dedication and commitment to the work and shows that he/she can be a reliable team mate. An ability to work well independently or with others is a real asset as well. Detail-related tasks are really important, as are one's ability to handle the same task over and over again. The basic trail ethic of leaving the place better than you found it is always good too. Passion is a key component to success in any field of work. Most everyone I've worked with is at heart a person who loves the outdoors or is a plant person. Usually and ideally it is both." –Rich Pederson, Southside Community Land Trust

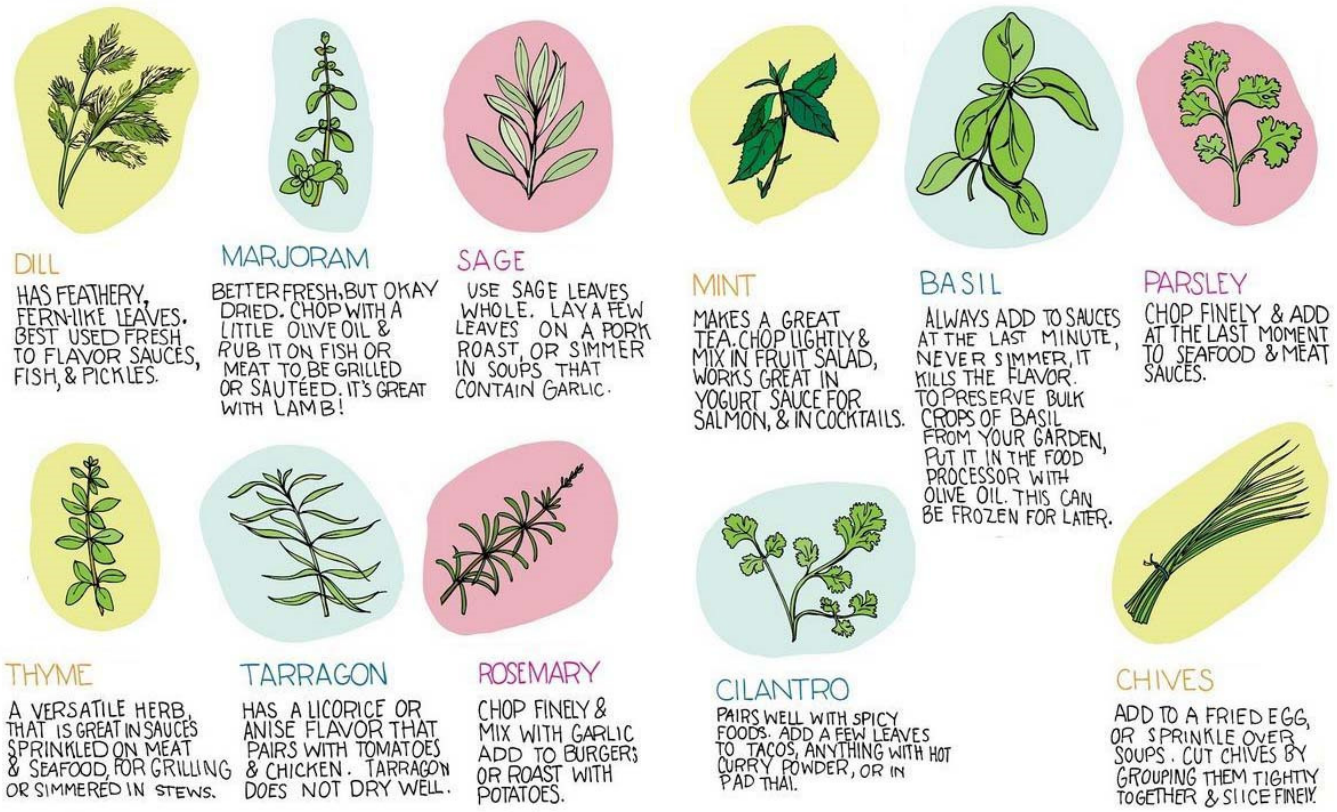
Introduction to Culinary Skills

Herbs are chopped in different ways depending on the type of herb & whether it will be used fresh or cooked right away.

There are some basic skills to learn when using fresh herbs, such as proper handling & storage, culinary uses, cutting & processing, & even understanding their growing cycle. As the herbs go through their natural growing cycle their flavors & uses can change. Basil is a good example. Basil can grow prolific with some basic pruning. The larger leaves that develop underneath are great for processing into pesto & flavored oils where the top or the tips are great for finishing salads, garnishing pastas & even for small flower arrangements. If the basil starts to flower it gives you even more creative ways to showcase this herb. It can be used in iced teas, dropped on top of soups, & placed on tomatoes.

As far as handling herbs & cutting them there are some basic terms to learn. Chiffonade means to cut into thin strips which is done for large fresh herbs to avoid bruising them which leads to discoloration. To mince means to cut up in tiny pieces which is for herbs that are going to be cooked right away so the discoloration isn't a factor. Herbs like parsley, sage, oregano, thyme, and rosemary are often minced.

Herbs can also be infused into oils, simple syrups, ice creams, custard and spirits.



If you are interested in a job in the culinary field, learn how to identify herbs and how to apply them to culinary practices.

CULINARY MEASUREMENTS & CONVERSIONS Measurements in recipes are given in a number of different units. Chefs and kitchen workers need to understand how all these measurement units relate. For example, there are 8 ounces in a cup, 2 cups in a pint, 2 pints in a quart and 4 quarts in a gallon.

DIG DEEPER: Become familiar with culinary unit conversions in Appendix I.

What do you look for in an employee? "Punctuality, enthusiasm, and honesty. When I am hiring I look at the applicant as a person—someone I have to work with closely everyday. I want someone who is honest about their skill level, willing to work hard and learn, and generally enthusiastic about the job. It's not just a job; what we do is a labor of love. If you wake up and dread going to work, it's not the right fit." - Matt Gennuso, Chez Pascal

Resources for Reentry in Rhode Island

Some of the many opportunities for additional education & training:

Groundwork RI—Adult Job Training Program (www.groundworkri.org)

Southside Community Land Trust—training for market gardeners, plant sale & much more (www.southsideclt.org)

Farmacy Herbs—herbal certification (www.farmacyherbs.com)

RI Tree Council—Tree Steward program (www.ritree.org)

Northeast Organic Farming Association (NOFA)—Organic Land Care Certification (www.organiclandcare.net) & new farmer technical advice

URI CoopExt—Master Gardeners & other classes (web.uri.edu/coopext)

RI Nursery & Landscape Association (RINLA)—Job board & training opportunities (www.rinla.org & www.facebook.com/The-Rhode-Island-Nursery-and-Landscape-Association-10150147399525594/)

Dept. of Labor & Training (DLT)—Real Jobs RI (www.dlt.ri.gov/realjobs/) & Network RI (www.networkri.org/)

Arborist Certification—International Society of Arboriculture (www.isa-arbor.com)

Serve Safe—Food Safety Training (https://www.servsafe.com/)

Dept of Transportation (DOT) Health Card (http://dotphysicaldoctor.com/find-cme-rhode-island/)

Social Enterprise Greenhouse—social enterprise business training (http://segreenhouse.org/)

Other Resources:

UMass Soil Lab—Soil testing (www.ag.umass.edu/services/soil-plant-nutrient-testing-laboratory)

URI Native Plants Guide (web.uri.edu/rinativeplants/)

Farm Fresh RI—information about using SNAP/EBT benefits at farmer's markets (www.farmfreshri.org)

Khan Academy—Practice math skills (www.khanacademy.org)

Jails to Jobs—Reentry advice (www.jailstojobs.org)

Reentry Campus Program—Education support (www.reentrycampusprogram.org)

Open Doors—Reentry support (www.opendoorsri.org)

Amos House—Reentry support, culinary programs (www.amoshouse.com)

RI Voter Information Center—Register to vote! (www.vote.sos.ri.gov/)

VOCABULARY REVIEW

- ☐ Habitat
- ☐ Pollination
- ☐ Ecosystem
- ☐ Native plants
- ☐ Invasive species
- ☐ Deadheading
- ☐ Mulch
- ☐ Cost estimate
- ☐ Containers
- ☐ Square feet
- ☐ Cubic yards
- ☐ Soil amendments
- ☐ Soil nutrients
- ☐ N-P-K
- ☐ Medicinal herbs
- ☐ Pests
- ☐ Beneficial insects
- ☐ Climate change
- ☐ Greenhouse gases
- ☐ Nomenclature
- ☐ Woody
- ☐ Herbaceous
- ☐ Evergreen
- ☐ Deciduous
- ☐ Tree key
- ☐ Cover crop

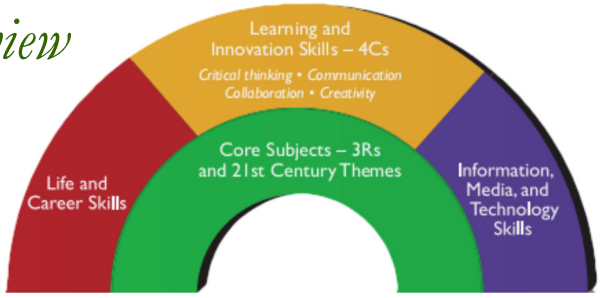
Garden Time's mission is to create garden programs for incarcerated men and women at the Rhode Island Adult Correctional Institution. Through the process of gardening, we foster education, inspiration and empowerment; teach inmates to grow their own food for economic and personal self reliance; and identify and connect with existing opportunities to allow for permanent re-entry into society.

Keep in touch! www.gardentime.us

21st Century Learning Skills Overview

from P21, http://www.p21.org/our-work/p21-framework

P21's Framework for 21st Century Learning was developed with input from teachers, education experts, and business leaders to define and illustrate the skills and knowledge students need to succeed in work, life and citizenship, as well as the support systems necessary for 21st century learning outcomes. It has been used by thousands of educators and hundreds of schools in the U.S. and abroad to put 21st century skills at the center of learning.



The 21st Century Knowledge-and-Skills Rainbow

Learning and Innovation Skills:

Learning and innovation skills increasingly are being recognized as the skills that separate students who are prepared for increasingly complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future.

Critical Thinking and Problem-Solving Skills

Students should be able to:

Reason Effectively

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

Use Systems Thinking

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

Make Judgments and Decisions

- Effectively analyze and evaluate evidence, arguments, claims and beliefs
- Analyze and evaluate major alternative points of view
- Synthesize and make connections between information and arguments
- Interpret information and draw conclusions based on the best analysis
- Reflect critically on learning experiences and processes

Solve Problems

- Solve different kinds of non-familiar problems in both conventional and innovative ways
- Identify and ask significant questions that clarify various points of view and lead to better solutions

Communication and Collaboration

Students should be able to:

Communicate Clearly

- Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
- Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
- Communicate effectively in diverse environments (including multi-lingual)

Collaborate with Others

- Demonstrate ability to work effectively and respectfully with diverse teams
- Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
- Assume shared responsibility for collaborative work, and value the individual contributions made by each team member

Creativity and Innovation

Students should be able to:

Think Creatively

- Use a wide range of idea creation techniques (such as brainstorming)
- Create new and worthwhile ideas (both incremental and radical concepts)
- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

Work Creatively with Others

- Develop, implement and communicate new ideas to others effectively
- Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
- Demonstrate originality and inventiveness in work and understand the real-world limits to adopting new ideas
- View failure as an opportunity to learn; understand that creativity and innovation is a long-term, cyclical process of small successes and frequent mistakes

Implement Innovations

- Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur

Life and Career Skills:

Today's life and work environments require far more than thinking skills and content knowledge. The ability to navigate the complex life and work environments in the globally competitive information age requires students to pay rigorous attention to developing adequate life and career skills.

Flexibility and Adaptability Skills

Students should be able to:

Adapt to Change

- Adapt to varied roles, jobs responsibilities, schedules and context
- Work effectively in a climate of ambiguity and changing priorities

Be Flexible

- Incorporate feedback effectively
- Deal positively with praise, setbacks and criticism
- Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments

Initiative and Self-Direction Skills

Students should be able to:

Manage Goals and Time

- Set goals with tangible and intangible success criteria
- Balance tactical (short-term) and strategic (long-term) goals
- Utilize time and manage workload efficiently

Work Independently

- Monitor, define, prioritize and complete tasks without direct oversight

Be Self-directed Learners

- Go beyond basic mastery of skills and/or curriculum to explore and expand one's own learning and opportunities to gain expertise
- Demonstrate initiative to advance skill levels towards a professional level
- Demonstrate commitment to learning as a lifelong process
- Reflect critically on past experiences in order to inform future progress

Social and Cross-Cultural Skills

Students should be able to:

Interact Effectively with Others

- Know when it is appropriate to listen and when to speak
- Conduct themselves in a respectable, professional manner

Work Effectively in Diverse Teams

- Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
- Respond open-mindedly to different ideas and values
- Leverage social and cultural differences to create new ideas and increase both innovation and quality of work

Productivity and Accountability Skills

Students should be able to:

Manage Projects

- Set and meet goals, even in the face of obstacles and competing pressure
- Prioritize, plan and manage work to achieve the intended result

Produce Results

- Demonstrate additional attributes associated with producing high quality products including the abilities to:
  - Work positively and ethically
  - Manage time and projects effectively
  - Multi-task
  - Participate actively, as well as be reliable and punctual
  - Present oneself professionally and with proper etiquette
  - Collaborate and cooperate effectively with teams
  - Respect and appreciate team diversity
  - Be accountable for results

Leadership and Responsibility Skills

Students should be able to:

Guide and Lead Others

- Use interpersonal and problem-solving skills to influence and guide others toward a goal
- Leverage strengths of others to accomplish a common goal
- Inspire others to reach their very best via example and selflessness
- Demonstrate integrity and ethical behavior in using influence and power

Be Responsible to Others

- Act responsibly with the interests of the larger community in mind

Information, Media and Technology Skills: *Today we live in a technology and media-suffused environment with: 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale. To be effective in the 21st century, citizens and workers must be able to create, evaluate, and effectively utilize information, media, and technology.*

Information Literacy Skills

Students should be able to:

Access and Evaluate Information

- Access information efficiently (time) and effectively (sources)
- Evaluate information critically and competently

Use and Manage Information

- Use information accurately and creatively for the issue or problem at hand
- Manage the flow of information from a wide variety of sources
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information

Media Literacy

Students should be able to:

Analyze Media

- Understand both how and why media messages are constructed, and for what purposes
- Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of media

Create Media Products

- Understand and utilize the most appropriate media creation tools, characteristics and conventions
- Understand and effectively utilize the most appropriate expressions and interpretations in diverse, multi-cultural environments

Information and Communications Technologies (ICT) Literacy

Students should be able to:

Apply Technology Effectively

- Use technology as a tool to research, organize, evaluate and communicate information
- Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy.
- Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies.

Tools of the Trade

Adapted from Lowe's Garden Tools Buying Guide, www.lowes.com/projects/gardening-and-outdoor/garden-tools-buying-guide/project

Spading fork for turning soil, lifting plants or bulbs, separating perennials, digging in rocky soil & aerating to relieve soil compaction.

Round point shovel for digging, lifting & throwing. Point cuts into the soil. The rim on top of shovel blade allows added foot pressure for digging holes.

Square point shovel for scooping & moving materials.

Garden Spade for cutting, digging, edging & lifting sod.

Edger for cutting a clean line where a lawn transition occurs.

Garden hoe blade is at the right angle to the handle for chopping.

Stirrup or action hoe pivots back & forth under the soil for weed cutting action.

Cultivator for scratching the surface prior to planting or around plant while growing. Available with long handle or as hand tool.

"Hori Hori" weeding knife for digging deep tap roots and planting.

Trowel for precision digging in small spaces.

Steel rake for moving or removing debris or working the soil for planting. Use the top edge to level garden beds.

Leaf rake for movement of leaves, grass clippings & other materials. Small sized rakes for cleaning planting beds.

Loppers are pruners with long handles for extra leverage. Some have ratchet-assisted cutting action for easier cutting.

Harvesting knives come in many sizes & with curved or straight blades.

Harvesting scissors for precision cutting.

Anvil pruners for cutting dead wood & woody stems.

Bypass pruners for precision cutting of tender stems. Makes cleaner cuts and can cut nearer to the trunk.

Pruning saw for cutting in restricted areas. Cuts on the pull stroke.

Bow pruning saw for quick cuts on large limbs when the cut is unobstructed.

Shears for shaping & trimming shrubs & hedges.

Pole pruner for overhead cutting without climbing. Rope & pulley operates cutter from the ground.

Chain saw for cutting large branches & trees.

Gloves for protecting hands.

Mattock has chopping & cutting blades for cutting through roots & breaking up ground.

Trimmer for edging lawns & cutting brush.

Wheel barrow for transporting materials. Tips easily & requires balance & strength.

Lawn mower for cutting lawns & mulching leaves.

Weed Identification

PURSLANE
Portulaca oleracea

BITTERCRESS
Cardamine hirsuta

SPOTTED SPURGE
Euphorbia maculata

CARPETWEED
Mollugo verticillata

WILD CARROT
Daucus carota

PINEAPPLE WEED
Matricaria discoidea

CHICKWEED
Stellaria media

MUGWORT
Artemisia vulgaris

NUTSEDGE
Cyperus esculentus

CINQUEFOIL
Potentilla simplex

CRABGRASS
Digitaria sanguinalis

SHEEP SORREL
Rumex acetosella

PLANTAIN
Plantago lanceolata

SOURGRASS
Oxalis stricta

LAMBSQUARTERS
Chenopodium album

HORSEWEED
Conyza canadensis

HENBIT & DEAD NETTLE
Lamium sp.

QUACK GRASS
Elytrigia repens

PIGWEED
Amaranthus lividus

MATGRASS
Polygonum aviculare

Rhode Island Planting Calendar for Fruits & Vegetables

Fruit or Vegetable	Days til Harvest	Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct	
		1	15	1	15	1	15	1	15	1	15	1	15	1	15	1	15	1	15
ASPARAGUS (purchase crowns)	1-2 Yrs						CR	CR	CR										
BEANS, BABY LIMA	60-100								S	S	S	S	S	S					
BEANS, PINTO	60-80								S	S	S	S							
BEANS, SNAP	60-80								S	S	S	S	S	S					
BEETS	60-80					S	S	S	S	S	S	S	S	S	S				
BLACKEYED PEAS	90-120								S	S	S	S							
BOK CHOY	45			S	S	S	S	S	S						S	S	S		
BROCCOLI	60-90 from transplant		I			T							I		T				
BRUSSEL SPROUTS	100-120 from transplant										I		T						
CABBAGE	80-90 from transplant			I			T				I		T						
CABBAGE, CHINESE	45 from transplant			I			T					I		T					
CARROTS	60-80				S	S	S	S	S	S	S	S	S						
CAULIFLOWER	80 from transplant						I		T	I		T							
CELERY	90 from transplant			I					T										
CHARD	60						S	S	S	S				S	S				
CORN, SWEET	70-90							S	S	S	S								
CUCUMBERS	60-90								S	S	S								
EGGPLANT	60 from transplant					I				T									
ENDIVE/ESCAROLE	80-120				S	S						S	S						
GARLIC	5-7 Mths																	C	C
KALE	60-90					S	S	S					S	S	S	S			
KOHLRABI	45-60 from transplant						I		T				I		T				
LETTUCE, HEAD	45-90					S	IS	S	T										
LETTUCE, LEAF	40-70					S	IS	S	T	S	S	S	S	S	S				
LEEK	160-200 from transplant				I				T										
MELONS	80-120 from transplant						I			T									
ONIONS, BULB	SETS: 4-5 Mths					Sets	Sets												
ONIONS, GREEN	90-100				S	S	S												
PARSNIPS	100-120											S	S						
PEAS	60				S	S	S	S											
PEPPERS	60-100 from transplant				I					T									

Fruit or Vegetable	Days til Harvest	Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct	
		1	15	1	15	1	15	1	15	1	15	1	15	1	15	1	15	1	15
POTATO (plant seed potatoes)	90-120					S	S	S											
POTATOES, SWEET (order slips)	90-120 from transplant									T									
PUMPKIN	90-120								S	S	S								
RADISHES	30-60				S	S	S	S	S	S	S	S	S	S	S				
RUTABAGAS	90-100						S	S				S	S						
SPINACH	40-90				S	S	S	S	S						S	S	S		
SQUASH, SUMMER	45-90									S	S								
SQUASH, WINTER	90-120									S	S								
TOMATOES	50-120 from transplant				I					T									
TOMATILLOS	65- 75 from transplant					I				T									
TURNIPS	50-75						S	S			S	S	S	S					

Legend: C: Plant Cloves; CR: Plant crowns; I: Start seeds indoors S: Direct-seed in garden; T: Transplant seedlings started indoors to garden

NOTES: Dates are based on final frost on May 15 and first frost on October 15.
Be aware of local microclimates that may make your garden cooler or warmer & alter frost dates.
Transplants should be exposed to the outdoors for increasing periods over several days before planting.("hardened off")

Perennial Plants for Pollinator Habitat

Swamp Milkweed
Asclepias incarnata

Butterfly Weed
Asclepias tuberosa

Sneezeweed
Helenium autumnale

Cardinal Flower
Lobelia cardinalis

Bee Balm
Monarda fistulosa

Gray Goldenrod
Solidago nemoralis

New England Aster
Symphyotrichum novae-angliae

Evening Primrose
Oenothera sp.

Purple Coneflower
Echinacea purpurea

Mountain Mint
Pycnanthemum spp.

Yarrow
Achillea sp.

Joe Pye weed
Eupatorium purpureum

Northern Blazing Star
Liatris novae-angliae

Anise Hyssop
Agastache foeniculum

Blue False Indigo
Baptisia australis

Borage
Borago officinalis

Catmint
Nepeta faassenii

Black Eyed Susan
Rudbeckia hirta

Meadow Sage
Salvia nemerosa

Globe Thistle
Echinops ritro

Appendix F

Invasive Plants of RI

BINDWEED
Convolvulus arvensis

JAPANESE BARBERRY
Berberis thunbergii

MULTIFLORA ROSE
Rosa multiflora

BLACK SWALLOWWORT
Cynanchum louiseae

JAPANESE KNOTWEED
Fallopia japonica

ASIAN BITTERSWEET
Celastrus orbiculatus

TREE OF HEAVEN
Ailanthus altissima

BURNING BUSH
Euonymus alatus

Botanical Names & What They Mean

Appendix G

alba = white
altissima = tallest
angustifolia = narrow-leaved
aurea = golden, yellow
autumnalis = of autumn
azurea = blue
barbata = bearded, hairy
borealis = from the north
campanulata = campanulate, like a bell
campestris = of the field
canadensis = from Canada
chinensis = from China
coccinea = red
compacta = compact
decidua = deciduous
densiflora = dense-flowered
digitata = (leaves) like a hand, w/5 lobes
edulis = edible
flava = yellow
-flora = -flowered
foetida = with an unpleasant smell
-folia = -leaved
fruticosa = shrubby
gigantea = giant
glabra = smooth
glutinosa = sticky
grandiflora = large-flowered
hirsuta = hairy
incana = grey
inodora = unscented
japonica = from Japan
lanata = woolly
lanceolata = lance-shaped (leaves)
latifolia = wide-leaved
lutea = yellow
macro- = large-
maculata = spotted
magna = big
maritima = maritime, near the sea
maxima = biggest
micrantha = small flowered
microphylla = with small leaves
millefolia = with many leaves
minima = small
minor = smaller
montana = from mountains
multiflora = many flowered
nana = small
nocturna = nocturnal
odorata = perfumed
officinalis = with herbal uses
ovalifolia = with oval leaves
pallida = cream
palustris = from marshes
parvi- = small-
parviflora = small flowered
parvifolia = with small leaves
pendula = hanging
perennis = perennial
phoenicea = purple
-phylla = -leaved
poly- = many
praecox = early, of spring
pratensis = field
procumbens = creeping
prostrata = prostrate
pumila = small
punica = red
purpurea = deep pink
pygmaea = small
quercifolia = oak=leaved
rosea = rose pink
rotundifolia = round-leaved
rubra = red
rupestris = of hills
sanguinea = blood-red
sativa = cultivated
saxatilis = of rocks
scandens = climbing
semperviva = perennial
spicata = spiked
spinosa = spiny
stellata = starry
sulphurea = yellow
sylvestris = of woods
tenuifolia = with thin, narrow leaves
tomentosa = tomentose, woolly
trifoliata = trifoliate, w/three-lobed leaves
umbellata = unbellate, w/fls in an umbel
vernalis = of spring
violacea = violet
viridis = green
viscosa = sticky
vitifolia = with leaves like a vine
vulgaris = common
-from www.theseedsite.co.uk/latin.html

Common Landscaping Shrubs

RHODODENDRON
Rhododendron sp.

AZALEA
Rhododendron sp.

YEW
Taxus baccata

JUNIPER
Juniperus sp.

LILAC
Syringa vulgaris

FOTHERGILLA
Fothergilla gardenii

HYDRANGEA
Hydrangea sp.

FORSYTHIA
Forsythia sp.

HOLLY
Ilex sp.

JAPANESE ANDROMEDA
Pieris japonica

ROSE OF SHARON
Hibiscus syriacus

BOXWOOD
Buxus sp.

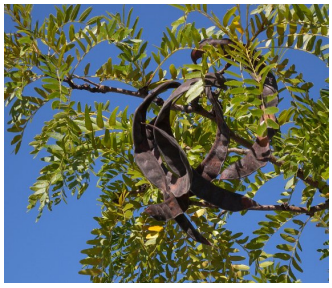
Common Landscaping Trees

MAPLE
Acer sp.

OAK
Quercus sp.

PINE
Pinus sp.

DOGWOOD
Cornus sp.



HONEY LOCUST
Gleditsia triacanthos

ARBORVITAE
Thuja sp.

SWEET GUM
Liquidambar styraciflua

RED BUD
Cercis canadensis

Garden Math

Sample Plant List for Costs

Sym	*Plant*	*Qty.*	*Size*	*Unit Cost*	*Total Cost*
	Shrubs				
CA	Caryopteris x clandonensis 'Dark Knight'	3	#3	$16.00	$48.00
F	Fothergilla gardenii - Dwarf Fothergilla	5	#3	$27.50	$137.50
OH	Hydrangea quercifolia - Oakleaf Hydrangea	3	#7	$44.50	$133.50
IT	Itea virginica 'Henry's Garnet' - Virginia Sweetspire	5	#3	$18.75	$93.75
PM	Prunus maritima - Beach Plum	1	#10	$52.00	$52.00
LB	Vaccinium angustifolium - Low-bush Blueberry	5	#1	$8.85	$44.25
	Perennials				
ya	Achillea 'Moonshine' - Yarrow	3	#1	$6.00	$18.00
ca	Anemone canadensis - Canada Anemone	3	#1	$6.00	$18.00
bw	Asclepias tuberosa - Butterfly Weed	5	#1	$6.00	$30.00
pl	Ceratostigma plumbaginoides - Dwarf Plumbago	6	4" pots	$4.00	$24.00
hf	Dennstaedtia punctilobula - Hayscented Fern	5	#1	$7.75	$38.75
ec	Echinacea purpurea 'Alba' - White Coneflower	5	#1	$6.00	$30.00
jp	Eupatorium purpureum - Joe Pye weed	6	#1	$6.00	$36.00
	Subtotal wholesale plant costs				$703.75
	6.25% MA sales tax				$43.98
	Total wholesale plant costs				**$747.73**

AREA is the measure of the space inside a shape. For example, you might want to find how large a garden is to calculate how much soil amendment you should use.

To find the area of a rectangle, multiply the length by the width. **$A=L \times W$**

Make sure the numbers are the same unit, for example length and width are both in feet and the answer will be in square feet.

For an irregular shape, break the space into smaller more regular shapes, find the areas of those shapes add them together.

To find the area of a circle, use the formula **$A=\pi \times r^2$**

Pi or π =3.14 and r is the radius of the circle, the measurement from the middle point to the edge or half of the diameter.

PERIMETER is the measurement of the outside boundary of a shape. For example, you might want to know how much fencing you would need to enclose a garden space.

To find the perimeter of a rectangle, add the length to the width and multiply by 2. **$P=2\ (L+W)$**

For an irregular shape, you can add the sides together. Your answer will be in linear feet.

To find the perimeter of a circle, multiply pi or π times the diameter of the circle. **$P=\pi \times d$**

When you are multiplying two numbers to find the area for example, remember that they must be the same units of measurement. Sometimes you will have to convert one unit of measurement to another. To convert inches to feet, divide by 12 since there are 12 inches in a foot. To convert feet to inches, multiply by 12.

Garden TIME-to-WORK

VOLUME is the amount of space in a container, so for example you might want to determine the soil volume you need to fill a raised bed.

To find the volume of a three-dimensional regular space, make sure all your units of measurement are the same, in feet. Then multiply the length by the width by the height. **V=L x W x H** The answer will be in cubic feet.

Soil, compost, gravel and other loose materials will come in deliveries of cubic yards. To convert cubic feet to cubic yards, divide by 27 because there are 27 cubic feet in a cubic yard.

garden TIME-to-WORK

Thanks!

Garden Time-To-Work Training Guide, first edition, March 2018 by Kate Lacouture, kate@gardentime.us. We are grateful for the input from local practitioners including Eugenie Najjar, Paul Thompson, Rich Pederson, Mary Blue, Drake Patten, Tom Morra, Steve Ricci, Emily Cotter, Nat Harris, Sarah Bernstein, Dave Johnson, Matt Gennuso, Christina Dedora, & Robert Rafka.

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Cover & P1: photos by Kate Lacouture **P2-3**: shovels (www.sowanddipity.com/a-shovel-and-a-spade/), herbs (www.oxfordlearnersdictionaries.com/definition/english/herb), life cycles (www.fws.gov/& weedcenter.org), dandelion (www.mystorybook.com/books/194594) **P4-5**: plant spacing (www.grit.com/farm-and-garden/vegetables/square-foot-gardening-zm0znd13zgou), seed packet (www.homefarmer.com/), biointensive planting (http://organic.kysu.edu/CompanionSpacing.shtml), how to plant a seed (www.nativesunjax.com/newsandevents/kids-activity-planting-seeds-for-pollinators, www.thriftyfun.com/Direct-Sowing-Seeds.html)watering (www.gardenersworld.com/how-to/grow-plants/how-to-grow-rocket-leaves-from-seed/), rows of lettuce (www.smilinggardener.com/organic-gardening-advice/vegetable-garden-layout/), broadcast lettuce (https://awaytogarden.com/mesclun-101-kate-spring-good-heart-farmstead/) **P6-7**: Life cycle (https://www.thinglink.com/scene/757321191718387714), parts of plants 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(https://gobotany.newenglandwild.org/species/celastrus/orbiculatus/), leaves (www.concordnet.org/774/Asiatic-Bittersweet-Celastrus-Orbiculatu), vine (https://thefeaturewell.wordpress.com/2011/05/19/battling-the-oriental-bittersweet/), poison ivy (www.thespruce.com/pictures-of-poison-ivy-4071932), plant a perennial (https://www.americanmeadows.com/blog/2011/03/23/how-to-plant-bareroot-and-potted-perennials/) **P18-19**: cultivator (www.amazon.com/Fiskars-70726935J-Big-Grip-Cultivator/dp/B000BPNKZ6), edger (www.doitbest.com/products/702074), edging the garden (www.sowanddipity.com/a-shovel-and-a-spade/), diagram (www.heirloomgardener.com/organic-gardening/techniques/pinching-and-deadheading-zm0z17wzmar), hand pruners (https://vanputte.com/tools-of-the-trade/), dead-head photo (https://wattersgardencenter.com/pinching-bigger-blooms/), straw mulch (http://learn.eartheasy.com/2016/07/mulch-your-garden-to-beat-the-heat/), leaf mulch (www.motherearthnews.com/organic-gardening/the-perfect-free-mulch-zbcz1406), bark mulch (www.bhg.com/gardening/yard/mulch/all-about-garden-mulches/ & https://hoosierhomemade.com/how-to-choose-and-apply-mulch-to-your-flower-beds/), how mulch works (www.yourgreenpal.com/blog/how-does-mulch-work) **P20-21**: plant deficiencies (www.growrealfood.com/gardening/identifying-plant-nutrient-deficiencies/), soil pH (http://homesteadbackyard.com/2014/07/test-improve-soil-ph-garden.html/), lime (www.lowes.com/pd/Timberline-Soil-Doctor-Pulverized-Garden-Lime-40-Pound-S-Lime/3058417) blood meal (www.naturescare.com/en-us/products/feed/natures-care-organic-blood-meal), bone meal (www.burpee.com/gardening-supplies/fertilizers/burpees-natural-organic-bone-meal-6-8-0-prod100071.html), fish emulsion (www.neptunesharvest.com/hf-191.html), soil test (Umass) **P22-23**: food system (https://localfood.ces.ncsu.edu/food-system-supply-chain/), equality, equity, justice (www.pinterest.com/explore/equity-vs-equality/?lp=true) **P24-25**: life cycle (http://theseedsite.co.uk), photosynthesis (Shutterstock), seed dispersal (2006 Encyclopedia Britannica, Inc.), grass (http://www.gardenwithoutdoors.org.uk/prev_weed_guide), weeding knife (https://cheyennegardengossip.wordpress.com/tag/weed-barrier-cloth/), hoe (www.thespruce.com/weeding-tools-1403217), herbal tea (www.almanac.com/content/natural-remedies-anxiety-and-stress), medicinal herbs photos (www.johnnyseeds.com/herbs/ & www.rareseeds.com/comfrey-/ & http://northernbushcraft.com/topic.php?name=stinging+nettle&region=on&ctgy=edible_plants) **P26-27**: zucchini (www.hgtv.com/outdoors/flowers-and-plants/vegetables/zucchini-101-growing-and-harvesting-this-super-squash), parts of plants (https://clipart.guru/images/clipart-49424.html), edible parts of plants (www.postharvest.net.au/postharvest-fundamentals/vegetable-physiology/structure-and-composition/), pest control (http://blog.agrivi.com/post/best-practices-for-pest-management-in-organic-farm-production), common pests (http://balconygardenweb.com/organic-pest-control-approaches/) **P28-29**: climate change (https://nca2014.globalchange.gov/report/appendices/faqs/graphics/potential-effects-climate-change), warming earth (https://simpleclimate.wordpress.com/2010/12/22/a-picture-of-climate-change-is-worth-1000-words/), by year (www.nationalgeographic.com/magazine/2017/04/seven-things-to-know-about-climate-change/) **P30-31**: nomenclature (www.odellengineering.com/informer/L_PA-Mar_10.htm) plant a tree (Arbor Day Foundation), trees ID (http://www.earlyforest.com/2009/10/tree-leaf-identification-tool.html) mulching (https://gepark.org/2017/05/volcano-mulching-bad-trees/), pruning detail (www.theiowagardener.com/How_to_Prune.html), arborist in tree (www.tfmorra.com/), tools (https://en.wikipedia.org/wiki/Garden_tool), tree pruning (www.arborday.org/programs/treecityusa/bulletins/summaries/001.cfm) **P32-33**: seed mix (http://keywordsuggest.org/gallery/885888.html), cover crop (www.johnnyseeds.com/farm-seed/cover-crop-mixes/), bird (www.audubon.org/news/to-help-birds-winter-go-easy-fall-yard-work) how to plant garlic (West Coast Seeds), knife (www.bonappetit.com/test-kitchen/how-to/article/how-to-chop-herbs), culinary herbs (www.dreamgarden101.com/list-of-cooking-herbs/) **Appendix A**: 21st century framework (www.p21.org/our-work/p21-framework) **Appendix B**: tools (www.lowes.com/projects/gardening-and-outdoor/garden-tools-buying-guide/project, www.amazon.com/Tanaka-Commercial-Straight-2-Stroke-TBC-340PF/dp/B0015Z1FVM, www.amazon.com/Barnel-BLK725P-Landscape-Harvest-Sickle/dp/B009SPZCHE, www.ruralking.com/carbon-steel-serrated-dig-tool.html?gclid=EAIaIQobChMIjsuj79Ha2QIV0sDICh1AzQ1uEAQYBiABEgIu1_D_BwE, www.cdiscount.com/maison/bricolage-outillage/ars-ars-320dx-m-ciseaux-de-vendange-en-acier-inoxy/f-11704141933-auc4965280662101.html) **Appendix C**: weeds (http://extension.umass.edu/landscape/weed-herbarium/**Appendix D**: planting guide (https://web.uri.edu/ceoc/files/RI-Planting-Calendar.pdf) **Appendix E**: pollinator plants (photos from GCD) **Appendix F**: invasive plants (www.invasive.org/index.cfm & http://extension.umass.edu/landscape/weed-herbarium/) **Appendix H**: shrubs (www.sunnysidenursery.net/white-rhododendrons/, www.mypigeonforge.com/blog/rhododendron-mountain-laurel-and-flame-azalea, www.amazon.com/Sandys-Nursery-Online-Juniper-Wilton/dp/B00CC5QG7W, www.thespruce.com/lilac-bushes-growing-tips-2132722, www.gardenia.net/plant/Fothergilla-Gardenii-Blue-Mist-Dwarf-Fothergilla, www.gardenia.net/plant/hydrangea-paniculata-limelight, www.britannica.com/plant/common-forsythia, www.pinelandsnursery.com/2015/02/ilex-glabra-inkberry-holly.html, www.gardeningknowhow.com/ornamental/shrubs/japanese-andromeda/grow-japanese-andromeda.htm, www.gardeningknowhow.com/ornamental/shrubs/rose-of-sharon/rose-of-sharon-bush.htm, www.houzz.com/winter-gem-boxwood) trees (https://en.wikipedia.org/wiki/Acer_saccharum, www.theplantigtree.com/products/northern-red-oak-tree, www.gardeningknowhow.com/ornamental/trees/pine/white-pine-tree-information.htm, https://en.wikipedia.org/wiki/Cornus, www.illinoiswildflowers.info/trees/plants/honey_locust.html, www.lowes.com/pd/5-Gallon-Emerald-Green-Arborvitae-Screening-Shrub-L5480/1000023669, www.sfrc.ufl.edu/extension/4h/trees/Sweetgum/index.html, www.wildflower.org/plants/result.php?id_plant=ceca4, **Appendix I**: unit conversion (www.kitchenno4.com/weight-vs-volume/), ruler (https://cdn.shopify.com/s/files/1/0223/1005/files/The_Sea_Sponge_Company_Ruler_-_12_inches_White_Black.jpg?4381)