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Gardening at Frost Valley YMCA

Leader Guide

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Overview

The gardening program invites Frost Valley campers to participate in hands-on gardening experiences in an informal and participatory way that supports learning while doing. Built into actual physical gardening are learning tasks that ground campers into some basic gardening components and concepts.

There are five days of tasks, totaling 7.5 hours of instructional/learning time. Gardening in the context of this class involves not only planting and harvesting, but also includes daily maintenance, composting, remedying soil, addressing gardening challenges, watering, etc.

Campers will participate in "lessons" that are experiential and directly related to the gardening that they will do. They can also drive the learning by asking to learn more about topics that might not be built into the materials, but which instructors should be propelled to research and present in response to student interest.

This overview is more of a gardening guide. Gardening, by nature, is an organic activity that results in the day-to-day negotiation of the unexpected. Thus, the guide offers tips and ideas for a range of things campers can do in the garden. Allow campers to be fluid during their gardening tasks, keeping up with what needs attention and observing new things each day. The gardening piece of the project is much less rigid than the more structured learning laid out in the lesson plans.

Goals and Objectives

Goal	Objectives
Build gardening appreciation	• Engage campers in hands-on gardening • Present and involve campers in foundational gardening concepts and principles • Promote the health, environmental and economic value of produce gardening • Encourage campers to creatively garden at home
Enhance awareness of the physical elements of gardening that support healthy plant growth	• Build camper plant and soil knowledge in order to appreciate the elements that contribute to healthy gardening and that must be tended • Engage campers in gardening practices that support healthy soil and plant life
Develop connections between gardening and healthy eating	• Encourage campers to eat fresh produce, preferably from the Frost Valley gardens or locally grown • Promote the taste and overall quality of fresh, locally grown produce with consideration of how store-bought produce differs and why • Promote understanding of the value of "locally grown" produce

Lessons and Framework

The curriculum offers a variety of learning tasks that touch on basic gardening elements and concepts. These are directly related to what campers will do in the garden, and where possible should be reinforced as campers are gardening.

- ✓ Each lesson has various interactive tasks. The instructor can choose to introduce a number of tasks through learning centers (Lessons 1 and 3 offer these).
- ✓ Each lesson has campers doing something in the garden; this will be based on the planting schedule, maintenance, troubleshooting, etc.

The lessons do not have to be taught exactly the way they are presented. Modify to address different age groups, time, etc.

Lesson	Overview
1: Go Gardening!	This series of lesson plans and tasks spreads over two days. Campers are grounded in the essence of gardening at Frost Valley and foundational gardening concepts–plant parts and soil-that will guide their planting tasks during the session. These are suggested tasks that can be modified according to timeframe, camper skills and interest, the state of the garden, and related factors.
2: Compost Quest	Campers explore the process and value of composting. They have the opportunity to informally discuss food justice issues as they garden.
3: Gardening Your Way!	In this lesson, campers have an opportunity to plant in a variety of containers, using basic gardening practice and principles. There is a focus on sub-irrigated planters, which are great in urban environments.
4. Seed Saturation	Campers explore the world of seeds exploring where they come from, exactly, using the plants in the Frost Valley garden; looking at them from a reproductive element, sorting them; and finally, learning how to save seeds.

About Teaching and Gardening

While campers are gardening, instructors can lead informal teaching in a number of ways. Use the information sheets in the packet to address topics that include mulching, weeding, produce grouping, watering, companion and succession planting, etc. Exploration will depend on the state of the garden, the session, camper interests, etc. The following are some examples of what can be done (this is not an inclusive list; instructors should wax creative!):

- ✓ Group items by color and learn what the colors mean in terms of nutritional value

- ✓ Group items by type of produce and discuss their nutritional value as a group
- ✓ Identify where seeds come from different plants in the garden.
- ✓ Observe which plants draw pollinators and discuss the value of such pollinators, not only to the garden, but also for the environment at large
- ✓ Generally observe and document change in the garden to make determinations about speed of growth, physical change over time, flowers, etc.
- ✓ Find and examine companion planting partners
- ✓ Experiment with different types of mulch to determine which kind best retains water
- ✓ Identify and resolve gardening challenges, like nutrient gaps and pests
- ✓ Explore which crops represent succession planting

Rainy Day Fun

The following is a short list of the many things campers can do during inclement weather. But, they don't have to be limited to rainy days. Some of these activities can easily be implemented into lesson plans and/or daily gardening tasks.

- ✓ Make dried fruit and veggies using the dehydrators in the greenhouse. Try to use as much produce as possible for this from the garden.
- ✓ Sort and examine seeds, and then make a seed art project
- ✓ Make seed tape that can be stored for planting by other Frost Valley guests
- ✓ Write fun poems describing "adopted" vegetables or fruit
- ✓ Package cured and ready-to-go compost to give away or for campers to take home
- ✓ Take soil samples that get sent to a lab to look for other types of nutrients, toxins, etc.
- ✓ Make a seed book or a book of pressed flowers and leaves, with descriptions
- ✓ Map out possible garden extensions- a rainwater garden, a butterfly garden, etc.
- ✓ Explore the region's native plants and map out a native plant garden
- ✓ Campers create garden signage, such as:
    - Laminated description cards for each item planted and for the seed cells/seedlings in the greenhouse
    - Reminder signs for watering, weeding, and other important garden tasks
    - Informational signs about healthy soil, plant lifecycle, etc.
    - Signage for the compost bins

Make newspaper seed pots (these are great because campers can plant the entire pot). Basic steps:

1. Lay out single sheets of newspaper, or cut them in halves or thirds, depending on the size of pot you want to make. The pot size should be for seed. Use a plastic cup or jelly jar for sizing.

2. Lay out a piece of waxed paper, and cut several strips of masking tape into strips a couple of inches longer than your pot bottom. By laying out the strips of tape in advance, it will make it easier for you to get the tape on your "pot" while holding the pot together with one hand.
3. Roll the newspaper around the jar or glass as straight and snug as possible. It's good if a few inches of newsprint hang over the bottom of the jar. They will form the bottom of the pot.
4. Place the cylinder on the table, and fold four "flaps" down toward the middle from the left, right, up and down sides.
5. While holding the bottom down with one hand, grab a strip of masking tape. Lay it over the folds. Press down. Now take a second piece of tape, and lay it over the folds in another direction, to make a cross of tape.

Top of Mind

Read the Lessons	Before doing anything, read all of the lessons. Be familiar with the tasks and the accompanying information. Read each lesson again the day before you will lead it. Be comfortable putting background details into your "own words" so that campers understand concepts. Modify/adapt tasks before entering the classroom.
Model, Model, Model	Be sure to model tasks and gardening activities where appropriate so that campers have a visual for understanding how certain things should be done, especially when gardening and using tools.
Materials and Preparation	The gardening session has a range of materials for the class lesson plans, the learning center tasks, and gardening. Make sure everything is in place and in enough quantities for each group.
Rainy Days	Most lesson plan tasks can be done in an indoor setting. If it rains during the first lesson, when campers make the rounds of the garden and greenhouse, one option is to comprehensively photograph the sites for campers to review indoors. This gives them a head start for the second session. Through photographs, campers can get a sense of what is planted, become familiar with the layout, learn about the various crops, etc., and build on what they learned from the photos to dive into the hands-on exploration during better weather. Rainy day activities can also be drawn from other lesson plans. Finally, instructor ingenuity leads to many other possibilities. See above for other rainy day ideas.
Gather Resources	Gardening is vast and can be approached in so many ways. Collect resources regularly. Keep a library of gardening books. If you have access to the Internet, bookmark sites offer "food for thought."
Go to the Experts	Frost Valley staff has so much knowledge, especially when it comes to gardening/agriculture and healthy eating. Ask them for guidance and advice…and even to teach a class or two.

Gardening Details

Gardening should be built into the daily lessons in various ways, from actual seed sowing to harvesting, and regular maintenance. Please read the following carefully as it will guide daily gardening activity. Be sure to share concepts and principles with campers where relevant.

Maintenance	Each day, campers checking the garden. Some days might require more maintenance than others; some days during sessions, campers might discover challenges that have to be addressed. For example, insects attacking a type of plant. Or, squirrels or other animals digging up seeds or bulbs. Maybe it is so hot that watering is needed more often. In the section called ***GARDENING TASKS FOR ALL*** is a gardening checklist for daily camper observation, gardening tasks, and descriptions of what campers can do to address certain situations that might come up. These situations present learning opportunities and can be turned into full lessons, if desired. Tasks can be grouped per group so that there is enough for each class to tackle, without task overlap.
Compost	There will be at least one standard compost bin (and perhaps a worm compost bin).. There is a brief lesson that highlights the importance of composting for the garden and the environmental value. If campers can, they will compost each day and also do any maintenance, e.g., adding layers of browns or water. If possible, cured compost should be available for amending garden soil and bolstering soil nutrients during new crop planting. Campers will recognize how compost builds nutrient-rich organic soil and adds or replaces missing nutrients.
Harvesting	Teach campers when something is ready to harvest. When crops are ready to harvest, campers with instructors should decide what to do with the harvested items. Should there be a tasting? Should the group make a salad and dressing? Whatever the decision, make sure campers carefully wash produce before they eat it. See ***HARVESTING TIPS*** to guide harvesting tasks.
Natural Treatments	There should be no use of any chemical fertilizers, other types of soil amendments, pesticides, etc. Campers should learn about natural ways to deal with soil, pest, and plant disease challenges. If Frost Valley already has methods for addressing these issues, instructors should be introduced to them.
Reading Seed Packets	Guide campers in how to read packets and the importance of accurate planting depth and spacing. Included is a seed-packet reading strategies guide and lesson plans.
Watering	Among campers' gardening tasks will be watering the garden. It is important for campers to learn how to properly water. Instructors might also consider setting up canisters to collect rainwater, which is better for plants overall..

Weeding	Part of the gardening will involve weeding. Campers should understand why weeding in a garden is important, but also be able to discern weed from vegetable, fruit, and flower plants. Likewise, campers should know how to effectively weed (i.e., pulling up with the root below the soil's surface). Catching them before they seed is the key. The document ***ALL ABOUT WEEDS*** offers some good tips and background information.
Seed Saving	There is a seed-saving task in the lesson plans, but wherever possible, especially if an item is deliberately left to bolt for seed collection, or whether the item has gone beyond its harvesting date, campers can identify where seeds are in the plant and collect them for saving and future planting. Included is some basic information on seed saving.
Greenhouse	Explore with campers why there is a greenhouse, what it does, its gardening benefits, etc. Have campers do some of their garden maintenance work in the greenhouse.

Document List

Gardening Tasks for All
Vegetable Groups by family
Vegetable Groups by color
Fruit Groups by family
Fruit groups by color
All about Weeds
Garden Challenges
Garden Pests and Problems: Plant Diseases
Watering Tips

GARDENING TASKS FOR ALL

This is a sample checklist. Create one that best matches the chores campers will be expected to do. Important to the chores is some reflection. Thus each chore below is coupled with things campers should be on the lookout for and thinking about. The checklist also helps campers identify garden challenges. Once this happens, work with campers to address these problems, which are likely to include pests and nutrient deficiencies in plants. See ***COMMON GARDEN CHALLENGES*** to begin to address some of these issues.

TASK	REFLECTION	DONE
		CAMPERS INITIAL AND DATE
Watering	Does the garden need to be watered? How do you know? How will you water it?	
Weeding	Are there weeds in the garden? What kind of weeds are they? Are they good or bad for the garden? How will you remove them?	
Harvesting	What's ready to harvest? How do you know? Is your adopted vegetable or fruit ready to be picked?	
Planting	Is the garden ready for the next round of plants? What's going to be planted?	
Check compost	Is the compost too dry? Does it need a layer of browns? Is any of it ready to use?	
Pests	Are there any insects on the plants? What kind of insect is it? Is it harming some or all of the plants? Is there any sign that an animal has been in the garden? Which animal do you think?	
Plant issues	How do the plants look? How does your adopted plant look? Are the leaves healthy or are they not looking so good? Is the plant wilting? Is it growing like it should?	
Mulch	Is the soil very dry? Does it get dry more quickly than usual? What kind of mulch will you put on it? If there is already mulch there, is it doing its job? Are there other types of mulch in the garden? Which one(s) seem to keep the soil adequately moist?	
Tools	What tools are being used and for what purpose? Are they in the right place-not sitting in the garden unused or in someone's way? Have they been cleaned off? Have they been stored? Are the tools in good shape?	
What's growing?	What's growing now? Where are the different vegetables in their growing stage? How will you document that growth? What gets planted next? How can you prepare for the next round of planting?	
Greenhouse	What needs watering? How should seedlings be watered? Are seedlings ready to transplant? Is the temperature right?	

VEGETABLE GROUPS BY FAMILY

Allium Vegetables

Garlic	Chives
Leeks	Shallot
Onion	Asparagus

Brassica vegetables (cruciferous or cabbage)

Bok choy	Cabbage
Broccoli	Cauliflower
Brussels sprouts	Chinese cabbage
Collard greens	Kohlrabi
Mustard greens	Rapeseed oil (canola)
Rutabaga	Turnip

Other cruciferous vegetables

Arugula	Daikon radish
Horseradish	Radish
Wasabi	Watercress

Asparagus

Buckwheat (not related to wheat)

Buckwheat
Garden sorrel
Rhubarb

Composite Vegetables

Artichoke	Dandelion
Chamomile	Endive
Chicory	Jerusalem artichoke
Romaine lettuce	Safflower
Sunflower	

Goosefoot

Amaranth	Beet
Chard	Quinoa
Spinach	Spinach
Sugar beet	

Gourd

Cantaloupe	Cucumber
Melons	Pumpkin
Squash	Watermelon
Zucchini	

Grass

Grains such as wheat, rice, and corn are in the Grass family, and so are several vegetable forms of these plants.

Bamboo shoots
Sweet corn
Wheatgrass juice

Legumes

Alfalfa	Beans
Carob	Chickpea
Green beans	Lentil
Pea	Peanut
Soy	

Mallow

Cacao
Cotton (cottonseed oil)
Okra

Morning Glory

Sweet potato

Nightshade

Eggplant	Potato
Tomato	Tomatillo
Chile pepper	Bell pepper
Italian pepper	

Umbelliferous

Carrot	Celery
Cilantro	Dill
Parsley	

VEGETABLE GROUPS BY COLOR

Beautiful Blues for a good memory & healthy aging	**Gorgeous Greens** for good vision, strong bones & strong teeth	**Wonderful Whites** for a healthy heart & lower cholesterol	**Youthful Yellows & Oranges** for a healthy heart, good vision & powerful immune system	**Raving Reds** for a healthy heart & good memory
Eggplant Purple asparagus Purple cabbage Purple carrots Purple peppers Potatoes (purple fleshed)	Asparagus Broccoli Brussels Sprouts Chinese Cabbage Cucumbers Green Beans Green Cabbage Green Onions Green Peppers Leafy Greens (Kale, Chard, Collards) Lettuce Peas Snow Peas Sugar Snap Peas Zucchini	Cauliflower Garlic Kohlrabi Onions Potatoes (white fleshed) White Corn	Butternut Squash Carrots Sweet Corn Sweet Potatoes Yellow Beets Yellow Peppers Yellow Potatoes Yellow Summer Squash Yellow Tomatoes	Beets Radishes Red Peppers Red Onions Rhubarb Tomatoes

Adapted from: Kaiser Permanente's Thrive Program

http://virginiafarmtotable.org/health/a-palette-of-healthy-fruits-and-vegetables

FRUIT GROUPS BY FAMILY

Berry Fruits	Stone Fruits	Citrus Fruit	Melon Fruit	Pomme Fruit	Tropical Fruit
Blueberry Raspberry Blackberry Huckleberry Acai Berry Goji Berry Cranberry Gooseberry Strawberry Currant Black Currant Elderberry Boysenberries Ground Cherry	Apricots Peach White Peach Donut Peach Nectarine Plum Pluot Sour Cherry Sweet Cherry	Orange Blood Orange Mandarin Orange Meyer Lemon Key Lime Kaffir Lime Kumquat Pomelo Tangelo Clementine Grapefruit	Watermelon Cantaloupe Honeydew	Apples Pears (Each has hundreds of varieties!)	Papaya Mango Coconut Guava Dragon Fruit Jackfruit Litchi Passion fruit Plantain Banana Prickly Pear Guanabana Tamarind Dates Figs Persimmon Pomegranate Star Fruit

Source: The Cooks Thesaurus, http://www.foodsubs.com/
*Note: these are not scientific categories but common recognizable fruit categories

FRUIT GROUPS BY FAMILY

Beautiful Blues for a good memory & healthy aging	**Gorgeous Greens** for good vision, strong bones & strong teeth	**Wonderful Whites** for a healthy heart & lower cholesterol	**Youthful Yellows & Oranges** for a healthy heart, good vision & powerful immune system	**Raving Reds** for a healthy heart & good memory
Blackberries Blueberries Dried Plums Pitted Prunes Purple grapes Plums	Green Apples Green Grapes Green Pears Honeydew	Brown Pears White Nectarines White Peaches	Apricots Cantaloupe Mango Nectarines Peaches Pineapple Yellow Apples Yellow Pears Yellow Watermelon	Cherries Red Apples Red Grapes Red Pears Raspberries Strawberries Watermelon

ALL ABOUT WEEDS

Help campers identify common garden weeds. They may recognize many of them. Provide names and pictures of those most commonly found in the Frost Valley garden. Post these for campers so they can recognize weeds when they come across them.

There might be weeds that campers did not know were weeds. Some weeds fall into the wildflower category. Probe with campers whether wildflowers are weeds? Is a weed only so in the eyes of the beholder? Is there such a thing as a good weed? Discuss with campers why weeds can be problematic. Is there ever a time when they are beneficial? (Good weed resource for young people: Invasive Plants on the Move www.weedinvasion.org)

Use chemical-free approaches to weeding, from removing from the root to mulching (the best approach). Protect unplanted beds with a cover of straw or tarps to stop weeds from the start. Weed when the soil is moist to more easily pull the plant with the root.

- ✓ Weeds and wildflowers can be found just about anywhere. Some are trouble; some can be useful and actually nice to look at.
- ✓ Weeds are simply plants growing in the wrong place. Some wildflowers are nothing more than weeds while others provide crucial sustenance to wildlife.
- ✓ There are two types of weeds—annuals and perennials. Annual weeds grow faster, typically spreading by seed and die out within a year. Perennial weeds are more difficult to control, as these weeds usually have extensive root systems that can cover large areas. They also come back every year.
- ✓ Weeds and wildflowers, like many plants, have varied methods of transportation, e.g., white, fluffy dandelion seeds of blow easily in the wind to scatter all around.
- ✓ In addition to wind, some plants rely on water to carry their seeds from one place to another. Insects, birds, and other animals carry or drop seeds in different areas.
- ✓ Weeds can be found in many different places. Some prefer well-drained, sandy or humus soil. Others thrive in moist or clay-like soil. Various weeds and wildflowers may be found along ditches and roadsides. Some may be seen in open fields and meadows.
- ✓ Weeds:
    - Grow very fast, smothering other plants to get the most light, minerals, and water
    - Produce lots of seeds and have lots of ways of spreading them around
    - Germinate their seeds quickly
    - Produce seeds that survive over several years and multiply in many different ways
    - Have an effective defense system that protect them from being eaten by animals or picked by people
    - Attract unwanted garden pests
    - Release chemicals that prevent other plants from growing

Other weed activities:

- Grow a bed of weeds for campers to investigate
- Explore about beneficial and edible weeds
- Identify plants that campers did not realize were weeds

GARDEN CHALLENGES

The garden is likely to experience a range of challenges-absence of nutrients, plant disease, insects and animals, etc. Campers will be able to identify some challenges just by observing the garden during their daily rounds.

The best approach is for campers to bring concerns to the attention of an instructor, who can explain what is happening and then describe how it can be addressed. That becomes another learning opportunity for campers and another task they can take on.

Note that any treatments for challenges should be chemical-free and use natural methods. Campers should see that many garden troubles have solutions that draw from organic elements in the environment.

Because the range of challenges can be vast, the following links offer types of challenges with solutions that can be put in place.

- ✓ **Disease Management in the Home Vegetable Garden**
  http://extension.uga.edu/publications/detail.cfm?number=C862

- ✓ **How to Control Garden Pests**
  http://www.bhg.com/gardening/pests/animal/how-to-control-garden-pests/

- ✓ **Recognizing Plant Nutrient Deficiencies**
  http://www.unce.unr.edu/publications/files/ho/2002/fs0265.pdf

- ✓ **Soil Amendment and Nutrient Deficiency Chart**
  http://www.ghorganics.com/page32.html

On the following page is a simple document for campers that can be distributed when they make their garden rounds.

GARDEN PESTS AND PROBLEMS: PLANT DISEASES

What Do Plant Diseases Look Like?

A gardener knows that a plant has a disease when the Plant shows "symptoms" of the disease, just as you have a fever or sneeze when you have a cold. Some of the most common symptoms of plant diseases are:

Leaf spots Small round, brown or yellow spots on leaves. Fungi, bacteria, viruses, and leaf nematodes can all cause leaf spots.

Yellowing of leaves Leaves turn yellow. Viruses, bacteria, and nutrient problems can all cause leaf yellowing.

Wilt Plants look like they need water (but they really do not). Wilt is caused by a root rot fungus or soil nematodes that eat plant roots.

Mildew A white or grayish mold on the leaves or stems caused by a fungus.

Lead mottling or mosaic A pattern of twisted yellow lines in the leaf. A virus causes leaf mottling.

Source: The Virginia Gardener Department of Horticulture, Virginia Tech
http://www.hort.vt.edu/HORT6004/network/YouthGardener/GardenPestsandProblems/plantDiseases.pdf