



Growing Healthy Kids

Garden-Enhanced Nutrition

Version 2.0

A researched-based, hands-on and learner-centered curriculum for children ages 6 to 9 with music, storybook, exercise, art, journaling and gardening activities. Each of the 12 lessons contains options for an outdoor, indoor or mural garden.

http://extension.oregonstate.edu/nep/garden_nutrition/

Growing Healthy Kids
Second Edition
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For Program Information

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For the parents, teachers, volunteers and friends who help grow a new crop of gardeners. Thank you for sharing your knowledge and enthusiasm.

In remembrance of Linda Lee “Sunny” Hunt
(August 25, 1953 to January 10, 2011),
whose legacy lives on in this curriculum and
in community gardens throughout Clatsop County, Oregon.

Acknowledgements

This curriculum began as a collaboration between Nutrition Education and Home Horticulture Extension faculty at Oregon State University, who together comprised the Garden Enhanced Nutrition Education (GENE) workgroup. GENE workgroup members included:

- Dana Baxter (Instructor, Family and Community Health, Oregon State University Extension Lane County)
- Anne Hoisington (Senior Instructor and Nutrition Specialist, College of Public Health and Human Sciences)
- Sunny Hunt (deceased, formerly Community Development Director, Family and Community Health, Oregon State University Extension Clatsop County)
- Gail Langellotto (Statewide Coordinator, Oregon State University Extension Master Gardener Program)
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- Weston Miller (Coordinator, Oregon State University Extension Metro Master Gardener Program)
- Maureen Quinn (Family and Community Health, Oregon State University Extension Washington County)
- Lauren Tobey (Statewide Coordinator, Oregon State University Extension Nutrition Education Program).

Team members worked together to develop lesson concepts, write and revise lessons, locate and collate supporting materials and pilot test lessons in schools.

In addition to the GENE workgroup, several individuals were crucial to the creation of this curriculum. Laura LaMotte created the graphic art and layout used throughout this curriculum. Laura also offered endless advice and ideas for how lesson elements might be visually interpreted. Barbara Brody, Jaime Fitch and Ashley Joyce shared lesson options, recipes and ideas that greatly enriched version 2.0 of this curriculum. Oregon State University Extension faculty Dana Baxter, Maureen Quinn, Anne Hoisington, Melinda Manore, Jaime Fitch, Ashley Joyce and Elaine Schrupf provided critical reviews of various versions of the curriculum. Laura Bonazzoli edited version 2.0 of this curriculum. Her keen eye and insightful suggestions greatly improved the final product.

Washington State University's CHANGE curriculum served as the foundation for many of the lessons included in the Growing Healthy Kids curriculum.

Funding for this project was provided by:

- Oregon State University Extension Nutrition Education Program
- Oregon State University Horticulture Department
- Supplemental Nutrition Assistance Program – Education (SNAP-Ed)
- Oregon Department of Human Services

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Section 1 - Growing Healthy Kids Overview



Growing Healthy Kids

Garden-Enhanced Nutrition

http://extension.oregonstate.edu/nep/garden_nutrition/

As children have more opportunities to experience new foods, they are more likely to accept those foods into their diet (Birch et al. 1987). Thus, providing opportunities for children to try a variety of vegetables and fruits is key to promoting increased fruit and vegetable consumption. Gardening is a great way to introduce children to a variety of vegetables and fruits, while allowing them to experience these foods in a way that is hands-on and fun.

Several studies indicate that garden-based, experiential education activities are effective vehicles for increasing fruit and vegetable consumption and promoting healthy food choices in young children. Specifically, children's willingness to taste vegetables (Morris et al. 2001), knowledge of nutrition (Morris et al. 2002) and preference for fruit and vegetables (Lineberger and Zajicek 2000; Morris et al. 2001, 2002; Morris and Zindenberg-Cherr 2002) have been shown to be positively affected by garden-based educational activities. In addition, a significant increase in consumption of vegetables and fruits has been documented for children participating in garden-based nutrition education programs (Langellotto and Gupta 2012). By comparison, children participating in nutrition education programs without a gardening component increase nutrition knowledge, but not preference for or consumption of vegetables and fruits (Langellotto and Gupta 2012). These results highlight the potential importance of garden-based activities to supporting a comprehensive food and nutrition education program.

Oregon State University's Growing Healthy Kids (GHK) curriculum uses gardening as a vehicle to expose children to a variety of vegetables and fruits and to encourage increased consumption of vegetables and fruits. A subset of curricular activities was piloted in two Oregon counties in 2008. A formative evaluation of GHK version 1.0 was conducted in 12 Oregon counties between 2009 and 2012. The results of the formative evaluation were used to modify the curriculum to improve the teaching and learning experience, as well as to promote expected outcomes. We continue to evaluate and improve GHK version 2.0 of the curriculum, which will be updated as needed. We encourage you to submit your comments and critiques on the GHK website (http://extension.oregonstate.edu/nep/garden_nutrition/) or via email at nep@oregonstate.edu.

How to use the Growing Healthy Kids curriculum

As an educator, your job is to incorporate food and nutrition information and activities into garden activities by using the lessons provided by the GHK curriculum. The following suggestions should help you get started.

Research suggests that elementary aged students learn best in classes with 25 or fewer students (Blatchford et al. 2003). Thus, class sizes should be kept small, whenever possible.

This curriculum is designed to be used with an indoor, outdoor or mural garden. These options are described shortly. Some educators find have found it helpful to use the mural garden, even if they are using the indoor or outdoor garden option. The intention of these different options is to offer you flexibility in your programming. You'll find you can adapt these options to a variety of educational sites (e.g. classroom, community garden, children's club, community center).

The curriculum includes *blue, italicized text*, to demonstrate how Nutrition Educators might choose to present the material to their students. This text is intended only as a guide. You do not have to memorize and recite it. However, you may find it useful to refer to the quoted passages for guidance.

The GHK curriculum was created for use within the Supplemental Nutrition Assistance Program-Nutrition Education (SNAP-Ed) programs of Oregon. Thus, GHK was created with the needs of these specific programs in mind. When activities and preparation tasks may not fit within the SNAP-Ed guidelines, we suggest that a Master Gardener or other volunteer take the lead.

Current SNAP-Ed guidelines allow for some expenditures that support garden-based nutrition education activities (U.S. Department of Agriculture, Food and Nutrition Service 2012). Specifically, the guidance currently reads:

Gardening is a beneficial activity that leads to the economical production and consumption of healthy and fresh food. Costs for the rental or purchase of garden equipment (fertilizer, tractors, etc.) or the purchase or rental of land for garden plots are not allowable. However, the purchase of seeds, plants, and small gardening tools and supplies to assist in developing school and community gardening projects are allowable SNAP-Ed costs. Educational supplies, curricula and staff salaries to teach gardening concepts that reinforce the beneficial nutrition aspects of gardening are allowable costs. Participants may use program benefits to purchase seeds and plants for individual gardening purposes. FNS (Food and Nutrition Service) encourages State Agencies to coordinate with the Federal, State, local, and private initiatives that create sustainable gardens to benefit schools and communities through collaborative efforts. (U.S. Department of Agriculture, Food and Nutrition Service 2012, page 5).

Aspects of the curriculum, such as the family letters or recipes, may be customized to best utilize local resources and to meet local needs. The GHK curriculum may be used for free, as long as Oregon State University Extension is credited appropriately: the Oregon State University Extension logo and a statement crediting Oregon State University Extension must appear on all handouts, family letters and other GHK materials.

Curriculum objectives

This curriculum aims to integrate nutrition education with gardening to promote healthy eating and healthy choices among children 7 to 8 years old. Although children are the primary audience for GHK, it is important to remember that many curricular materials are sent home and that family members are thus an important secondary audience.

There are three primary objectives. Specifically, children participating in the GHK curriculum will:

- 1) Increase their exposure to vegetables and fruits by tending a garden
- 2) Increase their consumption of vegetables and fruits, and

3) Model healthy food and lifestyle choices.

A secondary objective of GHK is to encourage healthy food and lifestyle choices in the families of GHK participants.

Organization of the curriculum

The GHK curriculum is organized according to plant parts (roots, stems, leaves, flowers, fruits and seeds) and garden components (sun, water, insects and compost). These plant parts and garden components are used as models for healthy behaviors in children.

This curriculum consists of a series of 12 lessons. Although the lessons may be taught individually, or in groupings of fewer than 12 lessons, research suggests that positive behavior changes are most likely to occur in interventions that are 50 hours or longer in duration (Olander 2007). Thus, educators are encouraged to teach the full complement of lessons. The lessons are listed below.

List of lessons

- Lesson 1 - Digging In!
- Lesson 2 – Six Yummy Plant Parts
- Lesson 3 – Root, Root Hurray!
- Lesson 4 – Water for People and Plants
- Lesson 5 – Stand Strong with Stems
- Lesson 6 – Energy In, Energy Out
- Lesson 7 – Leaves and Fun in the Sun
- Lesson 8 – Flowers, Bees and Broccoli
- Lesson 9 – Bunches of Variety
- Lesson 10 – Insect Olympics
- Lesson 11 – Breakfast for Kids and Soils
- Lesson 12 – Healthy Harvest Celebration

Lesson plan overview

There are six sections in each lesson plan:

1. Lesson overview: This section briefly lists the activities within the Teaching Outline of each lesson.
2. What you will need: This section includes recommended materials, including tools and handouts, that the educator may use when teaching each lesson activity.
3. Preparation: This section includes tasks the educator should complete before the lesson begins, such as hanging up posters to display (e.g., MyPlate Garden Poster) or setting up equipment or other items (e.g. flip chart, mural garden).

4. Teaching outline: Lesson activities are listed and described in this section. All lessons have a tasting activity and Lessons 2 through 9 and Lessons 11 and 12 include a recipe activity. The recipes can be prepared in class, and in conjunction with the Food Adventurer Adjectives Worksheet. Students have the opportunity to try each recipe as a Food Adventurer might: with at least one of their senses (e.g. sight, touch, smell and/or taste). One activity in each lesson (often, but not always, the final activity) describes the garden options. All lessons include an outdoor, indoor, and mural garden option.

5. Closure: This section provides a statement that reviews key lesson concepts, and reminds students of activities that they can complete on their own (i.e. the Food Adventurer missions).

6. Supplementary activities: In addition, included with each lesson are a variety of supplementary materials, such as storybook, journal exercise or art activities. These activities may be done by the Nutrition Educator if time allows. They also provide options for the Classroom Teacher to follow up or expand upon concepts introduced during GHK, after a particular lesson. Supplementary materials and associated activities are printed on a separate pages from the rest of the teaching outline, so that they can more easily be printed off and given to the Classroom Teacher.

Other additional materials include:

Family letters: A sample family letter is included at the end of each lesson. The letter informs parents and guardians about the purpose and activities of the GHK curriculum, provides tips family members can use to foster healthy eating at home, and introduces Oregon State University Extension as a resource families can use to learn about cooking healthy meals or growing vegetables and fruits. The family letter is an amendable PDF, which allows for personalization (e.g. to introduce local SNAP-Ed educators, adapt recipes to emphasize locally available ingredients, etc.).

Recipe sheets: Recipes are included with Lessons 2-9, and Lessons 11 and 12. These recipes are sent home to families, together with the family letters. One side of the recipe sheet is blank, so that children can draw a photo on the recipe card. All recipes are suitable for a limited-income, low-literacy audience and include widely available ingredients. They may be found on the Oregon State University Extension Food Hero website: foodhero.org

Reinforcements: Water bottles (Lesson 4) are available as reinforcements. These items reinforce key concepts, and promote healthy hydration and meals. Oregon State University Extension Nutrition Educators may order reinforcements from the Oregon State University Extension Nutrition Education Program Office:

Milam Hall
Corvallis, OR 97331
<http://extension.oregonstate.edu/nep>
nep@oregonstate.edu

Team-teaching the curriculum

The lessons in this curriculum may be independently taught by Extension Nutrition Educators, or may be taught as a team in which Nutrition Educators are supported by an Extension Master Gardener volunteer(s), or other volunteer(s). When Nutrition Educators independently teach the curriculum, it is important to remain in compliance with current SNAP-Ed guidelines. An advantage of working with a Master Gardener or other volunteer(s) is that volunteers may be able to teach aspects of a lesson that are important to the overall objectives, but are not SNAP-Ed compliant.

Before partnering with others to team-teach the curriculum, it is important to assign all team members well-defined roles. The specific roles and relationships should be discussed and decided by the team, and should be SNAP-Ed compliant. Potential roles for team members are identified below.

Nutrition Educator

The Nutrition Educator has the primary responsibility for teaching the curriculum, and for delivering the GHK curriculum at an educational site. The Nutrition Educator solicits volunteers to assist with GHK delivery, coordinates and manages the actions of volunteers, and communicates with the Classroom Teacher to ensure successful delivery of the curriculum.

Master Gardener

Master Gardeners are volunteers who have received advanced training from their local Extension Service in sustainable gardening techniques. After completing their training and passing a comprehensive final exam, Master Gardeners go on to volunteer their time and talents in support of approved gardening projects within their community. Projects are approved by the faculty or staff members who oversee Master Gardener volunteers within a county or region.

When working with one or more Master Gardener volunteers as part of the GHK curriculum, it is important to remember that the mission of the Master Gardener program is focused on outreach and education. Thus, please do not use Master Gardeners (particularly those Master Gardeners who are volunteering for GHK as part of their volunteer service hours) exclusively for laborious garden tasks. Weeding, soil preparation, transplanting seedlings and watering are important garden tasks. However, unless these tasks are used to educate others about sustainable gardening or growing their own food, Master Gardener volunteers are generally not allowed to apply time spent on these tasks towards their volunteer service hour requirement. The following are some ways that you can and should work with a Master Gardener.

- Consult a Master Gardener to help you develop a ‘master list’ of garden vegetables and fruits that will grow well in your local area, and in your soils.
- If you have a plot you are considering cultivating for use with this curriculum, invite a Master Gardener to assess the potential benefits and constraints of that particular site. In this way, you can capitalize on the site’s benefits, and either remediate or avoid the site’s constraints.

- Master Gardeners are trained in plant problem diagnosis. Thus, you can consult a Master Gardener to prevent and remediate problems in an indoor or outdoor garden.
- Master Gardeners may have access to seeds, soil and soil amendments at low or no cost. This will not always be the case, but it will not hurt to let the Master Gardeners in your area know the gardening materials and supplies that you could use.

Specific tasks should be mutually agreed upon by the Master Gardener volunteer and the Nutrition Educator, prior to partnering on the GHK curriculum.

Garden Volunteers

Although some Nutrition Educators may be experienced gardeners, others may not have much experience in the garden. It thus makes sense to partner with knowledgeable volunteers to assist with hands-on gardening activities. Besides Master Gardeners, community gardeners, parents or other volunteers can work with the children to sow the seeds or transplant, care for and harvest plants within the garden. Knowledgeable volunteers can also take responsibility for or assist with garden design, plant problem diagnosis and pest management.

Classroom Teacher

The Classroom Teacher manages classroom behavior, assists the Nutrition Educator with activities and tends to any medical or behavior emergencies. Teachers provide a comfortable educational space and should also be encouraged to enhance the lesson objectives by following up with supplemental lesson activities after the structured lesson.

Working with volunteers to deliver the curriculum

Working with volunteers to teach and deliver the GHK curriculum at educational sites can enhance the abilities of Nutrition Educators to use gardening as a vehicle to teach about food, nutrition and physical activity. Volunteers with gardening knowledge and experience can be particularly helpful if they are able to take responsibility for various garden tasks, including garden planning, garden preparation, plant installation and garden maintenance. A GHK Volunteer Position Description may be found on page 19.

Nutrition Educators and others teaching the GHK curriculum should start recruiting GHK volunteers well in advance. One model would be to work with the Extension agent or Program Assistant who manages the Master Gardener Program in the county where you will be teaching the GHK program. If GHK is cooperatively delivered as a Master Gardener and a SNAP-Ed project, your local Master Gardener coordinator can provide oversight and support of Master Gardener volunteers. You may solicit other volunteers through a notice in your school newsletter, a press release or ad in your local paper, or by contacting your local garden club.

How successfully you incorporate GHK volunteers into your local program depends greatly upon the individuals you select. Although some potential volunteers may feel that they have the right to be a volunteer, no questions asked, avoid the common mistake of trying to accommodate everyone who expresses an interest in the program. Instead, choose those volunteers whose

interests, skills, philosophy and availability align with the needs of the GHK program and be effective as a partner besides existing nutrition education staff.

Selecting potential volunteers

Oregon State University Extension is committed to providing a safe environment for young people participating in its programs. Refer to the current Oregon State University Extension policy and procedures for more specific information on how to screen and select volunteers who will be working with youth, as part of their duties as an Oregon State University Extension volunteer.

Garden options: No garden? No sun? No water? No problem!

Although gardens and gardening activities are used as a vehicle to teach particular concepts, it is important to emphasize that the act of growing food in a garden is not the primary goal of GHK. Instead, gardening is used as a means to promote healthy eating and physical activity via a series of hands-on activities.

You might be interested in using this curriculum, but lack access to an outdoor garden that has established beds, fertile and healthy soils and an irrigation system. Even if your educational site has access to an outdoor garden, it may not be possible to teach parts of this curriculum in the winter, when the number and types of vegetables that can be grown is limited and the weather may not make for a safe and comfortable instructional environment. Thus, although many of the activities in this curriculum would most easily and enjoyably be taught in an outdoor garden, we've provided three options for each lesson: outdoor garden (for those with access to a school or community garden), indoor garden (for those who are able to grow containerized plants indoors) and no garden (for those who are not able to grow plants, either outdoors or indoors).

Outdoor garden

The outdoor garden option is ideal as long as you can easily and safely transport your students from the site of instruction to the outdoor garden. Ideally, gardens will have soils that are deep, easily worked, well drained, slightly acidic (pH 6.2-6.8) and that contain at least 5% organic matter by volume. Master Gardener volunteers at your local OSU Extension office may be able to test the pH of your soil, and recommend amendments (such as lime) to correct pH issues.

Raised beds or raised rows are an excellent way to grow many vegetables in a small space. Soil preparation can be more efficiently concentrated into small areas with raised beds, and soils in raised beds warm up more quickly in the spring, relative to open soil. This allows vegetable plants to be sown as or transplanted as seedlings earlier in the spring. However, in areas with high summer temperatures, the soil in raised beds will also dry out more quickly.

For more information on how to plan an outdoor garden, as well as a list of plant varieties especially well-suited to Oregon school gardens, please refer to Oregon State University Extension Publication EM 9032, *An Educator's Guide to Vegetable Gardening* (Miller et al., 2011).

For information and varietal recommendations for container gardeners, please refer to *Growing Plants in Containers* (Chip Bubl, Oregon State University Department of Horticulture) <<http://extension.oregonstate.edu/nep/edmaterials/Gardening/infosheet-containerplants.pdf>>.

Indoor garden

The indoor garden option will work well for your program as long as you have access to a light bank (see the supplemental appendices for information on how to build a PVC light rack) and an empty or uncluttered shelf on which plants can be grown and over which the light bank can be placed. A south-facing window with good afternoon sun exposure may also work well. Take the time to pre-test germination rates and seedling growth in the window(s) before moving forward with an indoor garden option.

Mural garden

Each lesson contains a mural garden option. If you prefer and are able, you and your students can create the ‘mural garden’ on a classroom wall. Another option is to give each child a large piece of paper on which to draw or paint a personal mural garden. The mural garden is a dynamic depiction of different stages or concepts that may occur in an outdoor, growing garden.

Recurring activities

Several activities recur throughout the curriculum, and help to amplify the message that gardening supports healthy food choices and an active lifestyle. The repetition may provide structure to the lessons, and will help students to become accustomed to the lesson flow. You may choose to include or exclude these activities in particular lessons, depending upon the time you have available and the other activities you would like to conduct.

Food Adventurer missions

Students are offered the opportunity to complete Food Adventurer missions, by finding and trying new, healthy foods with at least one of their senses (e.g. sight, smell, touch, taste). Students can practice their use of adjectives by describing what they sensed on the Food Adventurer Adjectives Worksheet, and can show their friends their Food Adventurer sticker or button, when missions are completed.

GHK flash cards

A set of flash cards is provided to support the lessons in this curriculum. These cards have photos of foods that can be grown in a garden. Each food’s plant part category (i.e., root, stem, leaf, flower, fruit, or seed) is written on the front of the flashcard. Cooking, nutrition and gardening tips for each food can be found on the back. Display flash cards when introducing a new set of garden-grown foods (e.g., root vegetables, stem vegetables.) to the students. The purpose of the flash cards is to expose students to a variety of garden-grown vegetables and

fruits. An additional purpose of the flash cards is to help students make the link between plants grown in a garden and the vegetables and fruits that we eat.

Garden journal

Students can make elegant and low-cost garden journals, in which they can record their observations or thoughts on garden plants or edible vegetables. Observations can be recorded in words or drawings. Students can measure plant growth or note the date on which new structures (e.g., fruits, flowers) first appear on their plant. Students can record the personal results of their taste test, or can list favorite vegetables. You can find the template for the journal on the GHK website.

MyPlate Garden Poster

The MyPlate Garden Poster has a diagram of MyPlate (with associated food groups), and drawings of children and families enjoying a healthy meal made from garden-grown foods or engaging in garden-related physical activities. You can use this poster to reinforce the message that many foods from MyPlate can be grown in gardens, and that gardening provides opportunities to be physically active. Copies of the MyPlate Garden Poster can be downloaded from the GHK website.

Handwashing activity

Prior to handling, preparing, or tasting food, or after working in the garden, students must wash their hands. Handwashing is included as an activity in each lesson, prior to preparing and tasting in-class recipes, as well as after working in the indoor or outdoor garden. The first time that you lead the students through a handwashing activity, you will want to thoroughly describe all of the steps involved in proper handwashing. In subsequent lessons, you can briefly remind students of the steps, or allow them to demonstrate their ability to thoroughly and properly wash their hands. Handwashing instructions are provided in the supplemental appendices.

Plant Part Poster

The Plant Part Poster is used in most GHK lessons, to introduce students to an edible plant part. You can cover the labels on the Poster (using paper and tape), and reveal the name of a new plant part with a corresponding lesson. Within individual lessons, edible plant parts are presented, isolated from the other parts of the plant that help it to grow. The Plant Part Poster is intended to provide students with a visual depiction of how the different parts of a plant fit together. Copies of the Plant Part Poster can be downloaded from the GHK website.

Storybook recommendations

Suggestions for storybooks are included with each lesson. You may find these books useful extensions of the GHK lessons. Books may also be useful to classroom teachers who follow up

on curriculum lessons with in-class activities. Because research suggests that positive behavior changes are most likely to occur with longer interventions (Olander 2007), the storybook options are one way to extend and reinforce GHK lessons.

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GHK Volunteer Position Description

Title: Growing Healthy Kids Volunteer

Purpose: To provide support to the Growing Healthy Kids Program, by assisting Oregon State University (OSU) Extension faculty and staff with lesson preparations and curricular instruction.

Brief Description of Position

- Work directly with youth in the classroom and/or garden, under the supervision of OSU Extension personnel, by providing assistance with hands-on activities
- Consult with and provide gardening advice to OSU Extension Nutrition Educators in support of the Growing Healthy Kids curriculum, on an as-needed basis
- Prepare and maintain mural, indoor or outdoor garden for Growing Healthy Kids activities
- General classroom and/or garden set-up for Growing Healthy Kids curriculum
- Cooperates and assists local OSU Extension faculty and staff

Requirements

- Must be able to perform tasks listed in the Description of Position, as agreed upon and supervised by local OSU Extension faculty and staff
- Must agree to and clear a background history check and a criminal history check prior to volunteer service with OSU Extension
- Must demonstrate a commitment to diversity and to ensuring equal opportunity to those wishing to benefit from OSU Extension programs and services.
- Should have knowledge and skills in basic horticulture

Supervision

- The OSU Extension faculty member with responsibility for the local Family and Community Health (FCH) Nutrition Education Program (NEP) provides overall supervision and support.
- Immediate supervision and support may be provided by a program assistant or program coordinator, if available.

Print Volunteer Name: _____

Volunteer Signature: _____ Date: _____

OSU Extension Faculty Signature: _____ Date: _____