

Welcome Educators!

The Growing Healthy Habits Curriculum was developed by the University of Maryland Extension, Food Supplement Nutrition Education Program (FSNE) for integrating nutrition through gardening in Maryland elementary classrooms, grades K-5. This curriculum uses gardening as a tool for encouraging students to consume more fruits and vegetables and whole grains, and increase physically activity. Growing Healthy Habits provides engaging and exciting nutrition and gardening lessons that reinforce the Maryland Common Core, as well as Environmental Literacy Standards and STEM.

Growing Healthy Habits addresses the following key behavioral outcomes:

- Make half your plate fruits and vegetables, make your grains whole grains, and switch to fat-free or low-fat milk and milk products.
- Increase physical activity and reduce time spent in sedentary behaviors as part of a healthy lifestyle.
- Maintain appropriate calorie balance during each stage of life – childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.

While a healthy diet includes eating a variety of foods from all food groups, fruits and vegetables tend to be the most under-consumed food groups among low-income individuals (Lin 2005). There is a growing body of literature supporting gardening as an effective means for increasing fruit and vegetable consumption in young people (Heim et al 2009; Robinson-O'Brien, Story, & Heim 2009; McAleese & Rankin 2007). Integrating gardening education into schools or other youth education sites is only practical if the gardening program also helps meet the broad educational goals of the site.

Growing Healthy Habits provides an easy-to-use set of lesson plans that allow educators to provide learning experiences that complement their existing curriculum or programming goals, using vegetable gardening for demonstration of the concepts of the lessons. Each of the nine lesson units includes an introductory lesson, two follow-up lessons and a reflective journal lesson. A food tasting using fresh, seasonal ingredients is integrated into each unit to enhance the learning experience. While this curriculum teaches important lessons on gardening and nutrition, it is not meant to be a comprehensive experience for developing gardening skills among your students. The Appendix provides information for accessing resources for developing and maintaining a garden.

We hope that the Growing Healthy Habits curriculum helps you establish a strong nutrition education through gardening foundation for your program. Thank you for your dedication to providing children the tools they need to develop into healthy and successful adults.

Sincerely,

A handwritten signature in cursive script that reads "Heather C. Buritsch".

Heather C. Buritsch

References:

Lin, B. 2005. Nutrition and Healthy Characteristics of Low-Income Populations: Healthy Eating Index. AIB-796-1, USDA, Economic Research Service.

Heim, S., Stang, J., & Ireland, M. 2009. A Garden Pilot Project Enhances Fruit and Vegetable Consumption among Children. *Journal of the American Dietetic Association* 109: 1220-1226.

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Robinson-O'Brien, R. Story, M. & Heim, S. 2009. Impact of Garden-Based Youth Nutrition Intervention Programs: A Review. *Journal of the American Dietetics Association* 109: 273-280.

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This publication, *Growing Healthy Habits (EC-02-2010)*, is a publication of the University of Maryland Extension and Family and Consumer Sciences Food Supplement Nutrition Education Program. Please visit <http://extension.umd.edu/> to find out more about Extension programs in Maryland.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, University of Maryland, College Park, and local governments. Cheng-I Wei, Director of University of Maryland Extension.

This material was funded by USDA's Supplemental Nutrition Assistance Program – SNAP. The University of Maryland Extension will not discriminate against any person because of race, age, sex, color, sexual orientation, physical or mental disability, religion, ancestry or national origin, marital status, genetic information, political affiliation, and gender identity or expression. This institution is an equal opportunity provider. The Supplemental Nutrition Assistance Program (SNAP) provides nutrition assistance to people with low income. It can help you buy nutritious foods for a better diet. To find out more about Maryland's Food Supplement Program (SNAP), contact the Maryland Department of Human Resources at 1-800-332-6347 or apply online at <https://mydhrbenefits.dhr.state.md.us/>.

The information presented has met UME peer review standards.

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Published: Winter 2010

Revised: Spring 2016

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Introduction

The Growing Healthy Habits Curriculum was developed by the University of Maryland Extension, Food Supplement Nutrition Education Program (FSNE) for integrating nutrition through gardening in Maryland elementary classrooms, grades K-5. This curriculum uses gardening as a tool for encouraging students to consume more fruits and vegetables and whole grains, and increase physically activity. Growing Healthy Habits provides engaging and exciting nutrition and gardening lessons that reinforce the Maryland Common Core, as well as Environmental Literacy Standards and STEM

Growing Healthy Habits addresses the following key behavioral outcomes:

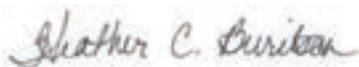
- Make half your plate fruits and vegetables, make your grains whole grains, and switch to fat-free or low-fat milk and milk products.
- Increase physical activity and reduce time spent in sedentary behaviors as part of a healthy lifestyle.
- Maintain appropriate calorie balance during each stage of life – childhood, adolescence, adulthood, pregnancy and breastfeeding, and older age.

While a healthy diet includes eating a variety of foods from all food groups, fruits and vegetables tend to be the most under-consumed food groups among low-income individuals (Lin 2005). There is a growing body of literature supporting gardening as an effective means for increasing fruit and vegetable consumption in young people (Heim et al 2009; Robinson-O'Brien, Story, & Heim 2009; McAleese & Rankin 2007). Integrating gardening education into schools or other youth education sites is only practical if the gardening program also helps meet the broad educational goals of the site.

Growing Healthy Habits provides an easy-to-use set of lesson plans that allow educators to provide learning experiences that complement their existing curriculum or programming goals, using vegetable gardening for demonstration of the concepts of the lessons. Each of the nine lesson units includes an introductory lesson, two follow-up lessons and a reflective journal lesson. A food tasting using fresh, seasonal ingredients is integrated into each unit to enhance the learning experience. While this curriculum teaches important lessons on gardening and nutrition, it is not meant to be a comprehensive experience for developing gardening skills among your students. The Appendix provides information for accessing resources for developing and maintaining a garden.

We hope that the Growing Healthy Habits curriculum helps you establish a strong nutrition education through gardening foundation for your program. Thank you for your dedication to providing children the tools they need to develop into healthy and successful adults.

Sincerely,



Heather C. Buritsch
Statewide Gardening for Nutrition Coordinator
Food Supplement Nutrition Education
University of Maryland Extension

References:

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Using the Growing Healthy Habbits Lesson Outline

Below is quick reference outline that will simplify the process of planning lessons using Growing Healthy Habbits. The outline breaks down each unit by lesson, listing time requirements, unit standards, summary of activities, supplies list, page numbers and supplemental teacher handouts. Symbols are used throughout the curriculum to indicate special pages of the book. For example, a tasting symbol (🍴) is used to indicate where in the curriculum a tasting or healthy recipe is included in a lesson, as well as the page in the Student Journal where a copy of the recipe can be found.

Below is a key for these symbols:



Tasting/Recipe –A healthy recipe or tasting can be found in this lesson



Student Lessons and Vocabulary



Student Journal



Teacher Handouts

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
What's So Great About Gardening					34-65
#1 MyPlate 	30 Min	* Listening * Nutrition & fitness	* Identify healthy foods and sometimes foods * Introduce "MyPlate"	* MyPlate Kid's Poster * Food models or pictures of sometimes and all the time foods	42-44
#2 Not All Vegetables are Created Equal 	30 Min	* Listening * Nutrition & fitness Recipe: * Mathematics * Reading Informational Texts	* Taste fresh, local produce and store bought * Learn the benefits of growing and/or buying local produce when it is in season	* "Multi-sensory Taste Test" handout * Local, fresh tomatoes and store bought	45-47
#3 Food System Sequencing 	35 Min	* Listening * Economics	* Sequence steps that foods take from the farm to the table * Processed vs. unprocessed foods	* Food pictures (end of unit) * Tape	48-51
Student Journal 	20 Min	* Writing * Language standards * Nutrition & fitness		* Journal * Student vocabulary * Recipe	52-55
Teacher Handouts 					56-65
Parts of the Plant That We Eat					66-98
#1 Plant Diagrams 	45 Min	* Comprehension of informational text * Listening * Life Science	* Parts of the plant we eat * Plant part jobs	* Fruit and vegetable picture cards * Tape	74-76
#2 Parts of the Plant Salad 	40 Min.	* Listening * Life Science Recipe: * Mathematics * Reading Informational Texts	* Discuss healthy and not so healthy choices for a salad * Prepare Parts of Plant Salad	* Blank copy of "Identify Parts of the Plant We Eat" handout * "Parts of Plant Salad" recipe, ingredients and equipment	77-78
#3 Parts of the Plant Relay Race 	40 Min.	* General reading Processes * Listening * Life Science	* Six plant parts: review * Relay race to identify parts of the plant we plant, harvest and eat	* Fruit and vegetable picture cards * 12 brown paper bags	79-80

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Parts of the Plant That We Eat					66-98
Student Journal 	30 Min.	<ul style="list-style-type: none"> * Writing * Language Standards 		<ul style="list-style-type: none"> * Journal * Student vocabulary * Recipe 	81-85
Teacher Handouts 					86-98
Feed the Soil and the Soil Will Feed You					99-129
#1 What is Soil Made Of? 	40 Min	<ul style="list-style-type: none"> * Comprehension of Informational Text * Listening * Measurement * Science Standards Skills and Processes * Life Science 	<ul style="list-style-type: none"> * Soil shakeup experiment * "What is Soil Made Of?" handout 	<ul style="list-style-type: none"> * Hand trowel/shovel * Clear glass jar with lid * Watch with second hand * Dry-erase marker or grease pencil 	108-112
#2 How do Different Soils Affect Our Planet? 	40 Min	<ul style="list-style-type: none"> * Listening * Science Standards Skills and Processes * Life Sciences 	<ul style="list-style-type: none"> * Soil types experiment * Soil drainage experiment 	<ul style="list-style-type: none"> * "Soil Shakeup Experiment" handout * 4 one-qt. plastic containers (reuse yogurt containers) * Scissors or pointed knife * 1 1/2 cups dried kidney beans * 1 1/2 cups flour * Sink or large plastic bin for catching water 	113-116
#3 Soil Salad 	35 Min	<ul style="list-style-type: none"> * Listening * Life Science Recipe: * Mathematics * Reading Informational Texts 	<ul style="list-style-type: none"> * "Soil Nutrients: Where did they come from? Where did they go?" * Prepare "Soil Salad" recipe 	<ul style="list-style-type: none"> * "Soil Salad" recipe * "What is Soil Made Of?" diagram * Copies of "Soil Nutrients: Where did they come from? Where did they go?" 	117-120
Student Journal 	20 Min	<ul style="list-style-type: none"> * Writing * Language Standards 		<ul style="list-style-type: none"> * Journal * Student vocabulary * Recipe 	121-124
Teacher Handouts 					125-129

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Variety: The Spice of Life!					130-175
#1 Eat Your Colors 	60 Min	* Listening * Science Standards Skills and Processes * Life Sciences * Nutrition and Fitness Recipe: * Mathematics * Reading Informational Texts	* Play "Take a Pick Game" * Prepare a colorful and healthy dish, "Confetti Spaghetti"	* Seed catalogues * "Confetti Spaghetti" recipe ingredients, and equipment * Fruit and vegetable picture cards for "Take Your Pick Game"	139-142
#2 Garden Survivor 	25-40 Min.	* Listening * Science Standards Skills and Processes * Earth/Space Science * Life Science	* Play "Garden Survivor" game * Students plan their own gardens and test them with the game	* Pictures of garden conditions (provided) * Pencils, markers * Copies of "Garden Survivor Cards"	143-147
#3 Who's Who in the Garden? 	25-45 Min.	* Listening * Science Standards Skills and Processes	* "Who's Who in the Garden" handout * Make Gardener Badges	* Copies of "Who's Who in the Garden?" handout * "Gardener Badge" (optional) * Stickers, colored pencils, markers and other art supplies, * Button-making machine, if available	148-149
Student Journal 	20 Min.	* Writing * Language Standards		* Journal * Student vocabulary * Recipe	150-153
Teacher Handouts 					154-175
Plan Your Planting					176-200
#1 Gimme Some Space! 	30 Min	* Listening * Science Standards Skills and Processes * Life Science	* Keys to successful gardens, planning a garden, plant needs, how much room plants need to grow * Radish spacing experiment	* 3 pint or quart-sized yogurt or deli containers * Tray or shallow bin * Potting soil * Paper or plastic cups for watering * 2 radish seed packets per experiment group * Marker * "Radish Spacing Experiment Instructions" * "Seed Spacing Experiment"	183-185

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Plan Your Planting					176-200
#2 What's On the Menu? 	35 Min	* Comprehension and Informational Text * Listening * Skills and Processes * Life Sciences	* Make observations from seed spacing experiment * "Vegetable Harvest Calendar" * "Spring Vegetable Garden Planting Plan" chart	* Seed catalogues (optional) * "Seed Spacing Experiment" handouts * Copies of "Vegetable Harvest Calendar" * "Spring Planting Table for Central Maryland"	186-188
#3 Garden on a Plate 	30 Min	* Listening * Science Standards Skills and Processes * Life Sciences * Nutrition and Fitness Recipe: * Mathematics * Reading Informational Texts	* Prepare a garden on a plate using what we have learned	* Copy of "Garden on a Plate" recipe, ingredients and equipment * "Seed Spacing Experiment" handout	189-191
Student Journal 	20 Min	* Writing * Language Standards		* Journal * Student vocabulary * Recipe	192-195
Teacher Handouts 					196-200
Seed Magic					201-226
#1 Seed Dissection 	40 Min	* Listening * Science Standards Skills and Processes * Life Science	* "Seed Dissection Experiment" * "Seeds We Eat" handout and discussion * Set up seed germination experiment	* Dry beans * 4 sandwich-size resealable bags * 4 paper towels * "Seeds That We Eat" * "Seed Anatomy and Germination" * "Seed Germination Experiment"	208-211
#2 Energy Storage in Seeds" 	50 Min	* Listening * Science Standards Skills and Processes * Earth/Space Science * Life Science	* Seed Germination Experiments: * Observe results of previous experiment and draw conclusions * Set up "Light vs. Dark" experiment	* 4 sandwich size resealable bags * 4 paper towels * 8 dry beans * "Seed Germination Experiment" handouts * "Seed in the Light vs. Seed in the Dark: The Scientific Method" handouts	212-215

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Seed Magic					201-226
#3 After Germination: Photosynthesis 	50 Min	* Listening * Skills and Processes * Life Sciences Recipe: * Mathematics * Reading Informational Texts	* Observe Light vs. Dark Experiment and draw conclusions * Prepare "Seed Salad" recipe * Optional recipe: "Confetti Bean Salsa"	* 1 sandwich-size plastic bag or cup per student * Recipe, ingredients and equipment for "Seed Salad" recipe * "Seeds in the Light vs. Seeds in the Dark" handout * "Seed Salad" recipe	216-218
#4 Student Journal 	20 Min	* Writing * Language Standards		* Journal * Student vocabulary * Recipes	219-223
Teacher Handouts 					224-227
Keep it Growing					228-253
#1 Water, Water, Everywhere! 	35 Min	* Comprehension of Informational Text * Listening * Skills and Processes * Earth/Space Science * Life Science	* The importance of water to our bodies * "The Water Cycle"	* "Water Cycle" handout	237-241
#2 To Weed or Not to Weed 	25-40 Min.	* Listening * Science Standards * Skills and Processes * Earth/Space Science * Life Science	* Discuss weeds and why they are not wanted in the garden * "Competition in the Garden" Game	* About 50 small paper cups	242-244
# 3 Put a Lid on It! 	40 Min.	* Comprehension of Informational Text * Listening * Science Standards * Skills and Processes * Earth/Space Science * Life Science Recipe: * Mathematics * Reading Informational Texts	* Review water cycle * Weed and mulching activity * "Fizzy and Fruity Water" recipe * Optional recipe: "Crunchy Vegetable Wrap"	* 5 small pots or quart-sized yogurt cups * Potting soil * 5 pieces of paper shredded * 5 sandwich bags * 2 different color pipe cleaners (10 total or each color, cut into small pieces) * Ingredients, equipment recipe for "Fizzy and Fruity Water" * "Water Cycle" handout (completed)	245-247
Student Journal 	20 Min.	* Writing * Language Standards		* Journal * Student vocabulary * Recipe	248-252

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Keep it Growing					228-253
Teacher Handouts 					253-254
Healthy Harvest					254-279
#1 Garden Inputs and Outputs 	40 Min	<ul style="list-style-type: none"> * Listening * Knowledge of Statistics * Knowledge of Number Relationships and Computation/ Arithmetic * Economics 	<ul style="list-style-type: none"> * "Value of Garden Inputs and Outputs" activity * "Garden Store Specials" * "Grocery Store Specials" 	<ul style="list-style-type: none"> * Calculators (optional) * 1 broccoli seed packet * 5 small disposable cups * "Garden Store Specials" handout * "Grocery Store Specials" handout * "Value of Garden Inputs and Outputs" handout 	261-264
#2 What's it Worth? 	30 Min	<ul style="list-style-type: none"> * Listening * Knowledge of Statistics * Knowledge of Number Relationships and Computation/ Arithmetic 	<ul style="list-style-type: none"> * Review a recipe and calculate the value of the garden produce compared to the cost at the store 	<ul style="list-style-type: none"> * "Grocery Store Specials" handout * "Produce Price Calculator" handout * Recipe for either "Garden Stir-fry" or "Harvest Fajita" 	265-267
#3 Does Money Grow on Plants? 	50 Min	<ul style="list-style-type: none"> * Listening * Measurement * Knowledge of Statistics * Knowledge of Number Relationships and Computation/ Arithmetic <p>Recipe:</p> <ul style="list-style-type: none"> * Mathematics * Reading Informational Texts 	<ul style="list-style-type: none"> * Prepare a recipe using vegetables harvested from your garden and calculate the savings of using home-grown food 	<ul style="list-style-type: none"> * "Produce Price Calculator" handout * Recipe handout from lesson #2, ingredients and equipment * Plastic grocery bags for harvesting * Scissors or hand pruners * Food scale * Calculator 	268-270
#4 Student Journal 	20 Min.	<ul style="list-style-type: none"> * Writing * Language Standards 		<ul style="list-style-type: none"> * Journal * Student vocabulary * Recipe 	271-275
Teacher Handouts 					276-279

Unit/Lesson	Time	Unit Standards	Activities	Supplies Needed	Page #s
Garden Fitness					280-303
#1 Almond Energy Burn 	35 Min	<ul style="list-style-type: none"> * Listening * Science Standards Skills and Processes * Life Science * Physics * Nutrition and Fitness 	<ul style="list-style-type: none"> * "Almond Energy Burn" activity * Observe energy in different forms 	<ul style="list-style-type: none"> • 1 almond • 1 potato (cut in half), • Paperclip • Cardboard box the size of a shoebox with the bottom cut out • Long barbeque lighter • Stopwatch 	288-291
#2 Energy in Food: Quality vs. Quantity 	35 Min	<ul style="list-style-type: none"> * Listening * Science Standards Skills and Processes * Life Science * Physics * Nutrition and Fitness 	<ul style="list-style-type: none"> * "Almond vs. Marshmallow Energy Burn" * "Reading Nutrition Facts Labels" handout 	<ul style="list-style-type: none"> • Copies of: "Reading Nutrition Facts Labels", "Almond Versus Marshmallow Nutrition Facts Label" • 1 almond nut • 1 mini marshmallow • 1 potato (cut in half) • 2 paper clips • Long barbeque lighter • Cardboard box with bottom cut out 	292-296
#3 Frozen Energy 	25 Min	<ul style="list-style-type: none"> • Listening • Nutrition and Fitness Recipe: <ul style="list-style-type: none"> • Mathematics • Reading Informational Texts 	<ul style="list-style-type: none"> * Prepare a PB&J Energy Smoothie * Learn about smart food choices and sometimes foods * Optional recipe: "Dilly Spinach Dip" 	<ul style="list-style-type: none"> • Recipe, ingredients and equipment for PB&J Energy Smoothie 	299-300
#4 Student Journal 	20 Min.	<ul style="list-style-type: none"> * Writing * Language Standards 		<ul style="list-style-type: none"> * Journal * Student vocabulary * Recipe 	300-303
Teacher Handouts 					304-305

This curriculum is intended for in-school or out-of-school youth. Each lesson has been linked to relevant Maryland State Curriculum objectives for grades one through five. In preparation for Maryland’s transition to the adoption of National Common Core Standards, a summary of Common Core State Standards for Mathematics and English Language Arts addressed across the curriculum is provided at the end of the introduction. Some adaptations to the teaching modalities may be necessary for the younger grades. However, all lessons have been successfully adapted and used with students from pre-kindergarten through high school, including special education populations.

Curriculum Organization

- **Unit organization:** The curriculum consists of nine units. Each unit contains introductory materials for the teacher, four lessons, and associated handouts. One lesson per unit includes a healthy recipe demonstration, making use of garden produce when available. The fourth lesson in each unit is a journal prompt, inviting students to reflect on and creatively respond to the content from the unit.
- **Unit introduction:** The introduction to each unit contains technical background information to support the teaching of the lessons. This information is not intended for your students, but will hopefully equip you to answer any complex questions you may receive. This is also where you will find a garden schedule to assist in synchronizing units with seasonal gardening activities. The vocabulary presented in the teacher introduction includes any words necessary for your understanding of the content. The student vocabulary presented in the Garden Journals (described below) contains age-appropriate vocabulary words and their definitions.
- **Lesson structure:** Each lesson contains an overview of what is accomplished during the lesson, learning objectives, materials and set up required, and a detailed process for proceeding through the activities. Lesson activities proceed from an introduction to the topic, to engaging discussion questions, to a hands-on learning activity. Throughout the lessons, you will find green “speech bubbles”. This is a visual indicator that the text inside the bubbles contains specific or technical concepts that might be best communicated by reading the text verbatim, at least until you are fully comfortable with the content of the lessons.

Curriculum Materials

- **Curriculum contents:** This teacher’s guide contains all lesson plans, background information, and handouts.
- **Garden Journals:** Low-income schools that commit significant time to partnering with FSNE to implementing the Growing Healthy Habits curriculum may be eligible to have Garden Journals printed for each of your students. The Garden Journal provides students with a personal, take-home piece that contains the student vocabulary, recipe, and journal prompt and response for each unit. We suggest that Garden Journals are kept in your classroom until the conclusion of your garden programming year at which point they can be sent home to share with families. More information on FSNE partnerships is included in the following pages.

If your site does not have access to Garden Journals, all components of the journal are in the appendix of this teacher's curriculum guide as handouts that may be duplicated at your site. You may choose to make your own Garden Journal by downloading the Garden Journal contents from the Maryland FSNE website (<http://md.nutrition-ed.org/>), or by copying and stapling the journal pages included in this curriculum guide

(indicated with a )

into a packet for each student. Alternatively, you can duplicate each page as needed: copy recipes when you will make them in the classroom, and journal prompt and response pages at the conclusion of each unit. Even if you have Garden Journals for your students, you may want to make a few copies of each recipe for the day of preparation so that the journals do not get dirty during food preparation.

Lesson Supplies: You can get the supplies necessary for the hands-on activities in lesson plans for free or very cheaply. Many items that will be used can be collected around your house. A comprehensive list of supplies begins on the next page. Start collecting these items to have on hand for the programming year.

Cooking Supplies: Acquiring supplies for preparing the recipes included in each unit will require a small budget. Every effort was made to streamline the cooking supplies needed to essential, low-cost items. As you begin implementing GHH, you may want to consider preparing only recipes that require the least equipment as you slowly build your cache of supplies. A comprehensive list of cooking supplies and food service items necessary to complete all cooking activities follows this page. Use this list when approaching parent groups, local businesses, or community organizations for sponsorship of your program.

In lessons that include preparing a recipe, the “Gather” section tells you the ingredients and equipment needed to prepare the dish. You will find the list of ingredients and equipment on each recipe handout included at the end of the unit. In addition to these items, you will need to have a supply available for serving the dish. These food service items, including paper or reusable plates, plastic or silverware, and napkins are included on the following supply list; you may want to have a supply on hand for food demonstration days.

Gardening Supplies: Supplies necessary for gardening will differ at every site. However, the Appendix includes a sample garden budget.

Here are some ideas to bring gardening to your site with little or no money.

- Consult the garden supply list and budgets in the Appendix and make a list of all potential sources of free or low-cost items in your community.
- Use disposable food containers, such as milk jugs or yogurt containers, for watering cans. Fill jugs with water for your plants, or punch holes in the bottom of a yogurt container to gently sprinkle water on seeds.
- Use disposable food containers as planting containers. Be sure to punch holes in the bottom of any planting container to allow water to drain through.
- Remember that most of the work your students will be doing in the garden can be accomplished with gloved hands, or perhaps trowels. Large tools (shovels, rakes) are only needed sporadically and may be borrowed from teachers, parents, or volunteers.
- Many seed companies will donate last year’s seeds free of charge. It is best to contact any local seed supplier or garden center in the fall when they are clearing out the season’s supplies. Contact the America the Beautiful Fund (<http://healthyshasta.org/downloads/gardening/Free-Seeds.pdf>) to request free seeds for your garden.
- Home and garden stores, hardware stores, and larger home renovation centers are often happy to donate to your school garden. Approach the managers of these stores personally with a letter describing your project and what you need to start growing.

Materials for Lessons:

(In addition to the handouts and visuals included with the curriculum)

- Tape
- Several paperclips
- Scissors
- Colored pipe cleaners (at least 25 total)
- Dry-erase marker or grease pencil
- Stickers, colored pencils, markers, and other art supplies
- Small paper cups (box of 50)
- Several small pots or quart-sized yogurt containers
- Paper towels
- Brown paper bags (approximately 12 total)
- Paper
- 1 cardboard box (about the size of a shoe box, or larger)
- Sandwich-size re-sealable baggies (box of 100)
- Plastic grocery bags
- Magazine pictures of fruits and vegetables (“all the time foods”) (*You may purchase food models from The National Dairy Council for \$36 per set. Call 800-220-6586*)
- MyPlate: <http://www.choosemyplate.gov/> for printable materials, SuperTracker and other tools, MyPlate videos, Healthy Eating on a Budget
- MyPlate graphic:
<http://westerndairyassociation.org/wp/wp-content/uploads/2012/01/Eat-the-MyPlate-Way-English.pdf>
<http://www.choosemyplate.gov/print-materials-ordering/graphic-resources.html>
http://www.choosemyplate.gov/downloads/mini_poster_English_final.pdf
http://westerndairyassociation.org/wp/wp-content/uploads/2011/05/Food_Model_Leader_Guide.pdf
- Long “barbeque” lighter
- Stopwatch or watch with a second hand
- Calculators
- Scissors or hand pruners
- Potting soil (1 small bag)
- Hand trowel or shovel
- Clear glass jar with lid
- Tray or shallow bin
- Seed catalogues (*You may request free seed catalogues from companies such as Peaceful Valley Farm and Garden Supply: <http://GrowOrganic.com>, Johnny’s Select Seeds: <http://www.johnnyseeds.com> or Seeds of Change: <http://www.seedsofchange.com>, Seed Savers Exchange: <http://seedsavers.org>) or view their catalogs on-line*)
- Broccoli seed packet
- Several radish seed packets
- Dried beans of any variety; black, kidney, lima, pinto (1 bag)
- 1 potato
- Several almonds, raw or dry-roasted
- Several mini marshmallows
- Flour (1 bag)
- Food scale
- Optional: Button making machine (may be available through an FSNE partnership)
- Optional: “Diary of a Worm” book by Doreen Cronin (recommended for students in grades 1-3)

FSNE Partnerships

FSNE is funded by the Food and Nutrition Service of the United States Department of Agriculture (USDA). FSNE programming is fueled by documentation of the efforts that our partners in the field invest into working with us to provide nutrition education to low-income audiences. As such, sites who wish to implement the Growing Healthy Habits curriculum may be able to develop a partnership with FSNE to help fund materials and supplies for the program. Partnerships can be tailored to meet your site’s needs, and are based on a commitment of your time to delivering the program in exchange for FSNE instruction, training, resources, and expertise.

The USDA funds nutrition education and gardening supplies. However, the level of FSNE funding for seeds, tools and soils may be limited based on the size of the garden and other factors. In developing a partnership with FSNE, our educators will work with you to identify funding sources for your gardening project, or connect you with gardening experts at the University of Maryland who may be able to assist you in developing your site. If you are interested in discussing an FSNE partnership, please visit <http://extension.umd.edu/nutrition/fsne/index.cfm>.

Maryland State Curriculum

While there is a pressing need to provide young people with tools and knowledge for making healthy dietary choices, FSNE recognizes that, for school garden sites, teachers’ instructional time is extremely valuable. This curriculum was developed with the intention of enhancing existing education by creating opportunities for reinforcement of classroom concepts in the garden.

The introduction to each unit includes tables that identify the Maryland State Curriculum objectives addressed in each lesson. A table for each content area (Health, Math, Reading/English Language Arts, Science, and/or Social Studies) relevant to the unit is included.

Additionally, because each unit includes a recipe, a journal prompt, and student vocabulary, tables highlighting the Maryland State Curriculum objectives that are addressed each time your students complete a recipe, journal or vocabulary review follow this page. In preparation for Maryland’s adoption of National Common Core Standards, tables highlighting Common Core State Standards addressed in each of these activities are also included. This information should help you document your teaching of grade-level standards using the lessons in the curriculum. It is our hope that the standards tables will also assist you in determining how and when to deliver the content based around opportunities to reinforce your existing curriculum.

State Curriculum Identifiers - Recipes - Math Standards

Identifier	1st	2nd	3rd	4th	5th
Standard 3.0 Knowledge of Measurement:					
B.1.	b. Identify and compare units of capacity using cups and gallons	b. Measure capacity of objects using cup, pint, quart, liter, and gallon	b. Measure capacity of containers to the nearest cup, pint, quart, gallon, milliliter, and liter using graduated containers		
Standard 6.0 Knowledge of Number Relationships and Computation/Arithmetic:					
A.2.	a. Read, write, and represent fractions as parts of a single region using symbols and models with denominators of 2 or 4	a. Read, write, and represent fractions as parts of a single region using symbols or models with denominators of 2, 3, or 4	a. Read, write, and represent fractions as parts of a single region using symbols, words, and models		
Standard 7.0 Processes of Mathematics:					
D.1.	b. Identify mathematical concepts in relationship to other disciplines	b. Identify mathematical concepts in relationship to other disciplines	b. Identify mathematical concepts in relationship to other disciplines	b. Identify mathematical concepts in relationship to other disciplines	b. Identify mathematical concepts in relationship to other disciplines
D.1.	c. Identify mathematical concepts in relationship to life	c. Identify mathematical concepts in relationship to life	c. Identify mathematical concepts in relationship to life	c. Identify mathematical concepts in relationship to life	c. Identify mathematical concepts in relationship to life

These objectives are touched on in the recipes, but not to the extent they would be in a Math lesson. The recipes can be used to complement Math or modified to suit the teacher's needs. Additionally, the teacher may plan extensions to Growing Healthy Habits activities to the connections to the Math curriculum.



Common Core State Standards – Recipes – Mathematics

Identifier	1st	2nd	3rd	4th	5th
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Numbers and Operations—Fractions (NF)					
			1. Understand a fraction as the quantity formed when a whole is partitioned into equal parts.	1. Explain why a fraction is equivalent to a fraction by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.	1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
			2. Compare two fractions with different numerators and different denominators.	2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.	
			3.b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent, e.g., by using a visual fraction model.		
			4.a. Understand a fraction a/b as a multiple of $1/b$.		
Measurement and Data (MD)					
			1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.		
			2. Measure and estimate liquid volumes and masses of objects using standard units.		
					3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement.



State Curriculum Identifiers - Vocabulary - Reading/English Language Arts Standards

Identifier	1st	2nd	3rd	4th	5th
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Standard 1.0 General Reading Processes:

D.1.	b. Discuss words and word meanings daily as they are encountered in texts, instruction, and conversation	b. Discuss words and word meanings daily as they are encountered in texts, instruction, and conversation	b. Discuss words and word meanings daily as they are encountered in texts, instruction, and conversation	b. Discuss words and word meanings daily as they are encountered in texts, instruction, and conversation	b. Discuss words and word meanings daily as they are encountered in texts, instruction, and conversation
D.1.	e. Connect unfamiliar words from texts, instruction and conversation to prior knowledge to enhance meaning	c. Make connections to prior knowledge and new vocabulary by listening, reading, and responding to a variety of texts			
D.3.	b. Use unfamiliar words introduced in literary and informational texts	b. Use unfamiliar words introduced in literary and informational texts	d. Use new vocabulary in speaking and writing to gain and extend content knowledge and clarify expression	d. Use new vocabulary in speaking and writing to gain and extend content knowledge and clarify expression	d. Use new vocabulary in speaking and writing to gain and extend content knowledge and clarify expression

These objectives are touched on in the vocabulary presented in the students' Garden Journals, but not to the extent they would be in a full Reading/English Language Arts lesson. The vocabulary sections can be used to complement R/ELA lessons or modified to suit the teacher's needs. Additionally, the teacher may plan extensions to Growing Healthy Habits activities to enrich the connections to the R/ELA curriculum.



The Scientific Method

While gardening provides wonderful opportunities for cross-disciplinary learning, science is one content area that is consistently represented in the GHH lessons. Science testing has been added to Maryland State Assessments, and providing students with foundations in the sciences will become increasingly important. In many of the GHH lessons, students participate in simple experiments to answer questions about processes in the garden. For each experiment, they are provided with a handout that guides them through using the scientific method to answer a question. The handout asks them to complete sections describing the hypothesis, results, and conclusions of the experiment. In completing these experiments, it might be useful to review or introduce the scientific method as the standard process for testing and answering a question. The scientific method includes the following basic steps:

1. Observing a phenomenon and formulating a question
2. Doing background research
3. Constructing a hypothesis
4. Testing the hypothesis with an experiment
5. Analyzing results
6. Drawing conclusions
7. Repeating experiment or developing new questions based on the conclusions

For more information on teaching the scientific method, we recommend the following website:
http://www.sciencebuddies.org/science-fair-projects/project_scientific_method.shtml

Linking to the Garden: While the lessons can be taught in any order, at any time of year, they are most meaningful when they are reinforced by gardening activities relevant to the content, and when produce from the garden can be used in the recipes. To help you accomplish this, we have provided a “Linking to the Garden” section in each unit’s introductory materials, which includes:

- The best month for implementing the unit
- What to plant
- What might be available to harvest for the unit’s recipe or other uses
- Other gardening activities that reinforce the content of the unit

Two separate unit sequences are provided: one for school year (September - June) programs (page 29), and one for growing season (March - October) programs found on (page 30). In the school year sequence we have not recommended content for December, due to scheduling conflicts around holiday breaks. The schedule for each type of program is summarized in a master timeline on the following pages. Please note that “Garden Fitness” is a ‘bonus’ unit discussing physical activity in the garden. It can fit anywhere in the flow of lessons, and works particularly well when there are vigorous physical tasks to complete in the garden.

Vegetable selections: The recommendations for what to plant is by no means a comprehensive list of what can be grown in a Maryland vegetable garden; we have focused on planting vegetables that are either used in the recipes, or which are easy to grow and prepare in a youth gardening program. The planting schedule is also paced so that something can be planted each month during the growing season (rather than just in May). If you are able to plan and plant a more diverse garden, by all means do so! But if you are just starting out, following the recommendations will help you plan for a successful first season.

Harvesting: Exactly when your garden produces its first cucumber will depend entirely on uncontrollable and unpredictable variables such as rain, soil temperature, and sun; however, we have done our best to give guidelines that will help you plan when you might be able to complete a recipe activity using garden produce. However, if you plan to make a “Plant Parts Salad” or other recipe using garden produce, visit the garden frequently to assess when you might expect to have harvestable lettuce or radishes before buying other ingredients. In many recipes, you can substitute whatever you happen to have available from the garden for the vegetables listed.

When to garden: Planting, harvesting, or other gardening activities are not explicitly written into any of the lesson plans. While it might be ideal to follow a lesson immediately with garden work, finding the time to get your students outside is dictated by many factors, including your daily schedule and weather events. The best time to get your students to complete the suggested gardening activities is whenever you can find the time! This curriculum provides enough content for four lessons per month (roughly one lesson per week); it should be expected that, at some point, lessons are sacrificed in favor of time spent in the garden. That said, given that journal prompts are brief activities, you may want to consider following garden journaling with a visit to the garden.

Unit Sequence and Gardening Schedule

for Schoolyear Programs



Unit #	Title	Recommended Month	Plant	Harvest	Other
1	What's So Great About Gardening?	September	<u>Transplant:</u> Collards, kale, lettuce <u>Direct seed:</u> Radishes	Tomatoes for taste test, if you had a summer garden.	General garden maintenance.
2	Parts of the Plant That We Eat	October	<u>Direct Seed:</u> Garlic Cover crop (late October)	Lettuce and radishes for "Plant Parts Salad," other salad vegetables may be available.	Sow cover crop seeds, general garden maintenance.
3	Feed the Soil...and the Soil Will Feed You!	November	None	Lettuce and leafy greens for "Soil Salad"; any other vegetables that may still be available in your fall garden.	Pull out spent plants and make compost pile, cover garden soil with leaves or other mulch.
4	Variety: The Spice of Life!	January	None	None	Use seed catalogues to select any special varieties you want to grow in the garden this year.
5	Plan Your Planting	February	<u>Start transplants indoors (mid to late February):</u> Cabbage, lettuce	None	Students help create a garden map and planting schedule; teachers and volunteers meet to create a supply list, a plan for acquiring materials, and a maintenance schedule.
6	Seed Magic	March	<u>Start transplants indoors:</u> Broccoli, collards, kale <u>Transplant (mid-March):</u> Cabbage, lettuce <u>Direct seed (mid-March):</u> Peas, radishes, spinach	None	Work compost or other organic matter into the garden a week or two before planting, build trellis for peas, thin seedlings (radishes, spinach) a few weeks after planting.
7	Keep It Growing	April	<u>Transplant:</u> Broccoli, collards, kale <u>Direct seed:</u> Carrots <u>Start indoors:</u> Sweet potato slips	Leafy greens, lettuce, and spinach to send home with students (late April).	Thin carrots (a few weeks after planting); water, weed, and mulch your garden to reinforce the concepts learned in this unit.
8	Healthy Harvest	May	<u>Transplant:</u> Cucumbers, eggplant, peppers, squash, sweet potatoes, and tomatoes (if garden will be maintained through summer)	<u>Mid- to late- May:</u> Baby carrots, garlic, leafy greens, and radishes for "Garden Stir-fry" (Note: carrots and garlic will need some time to mature; harvest the biggest for the recipe and leave the rest to grow until the end of the school year).	Plan for summer garden care; general garden maintenance.
9	Garden Fitness is an extra unit that may be incorporated anytime during the schoolyear.				

Unit Sequence and Gardening Schedule for Growing Season Programs



Unit #	Title	Recommended Month	Plant	Harvest	Other
1	Plan Your Planting	March	<u>Start transplants indoors (early March):</u> Broccoli, collards, kale <u>Transplant (mid- March):</u> Cabbage, lettuce <u>Direct seed (mid March):</u> Peas, radishes, spinach	None	Students help create a garden map and planting schedule; teachers and volunteers meet to create a supply list, a plan for acquiring materials, and a maintenance schedule; work compost or other organic matter into garden a week or two before planting; build trellis for peas.
2	Seed Magic	April	<u>Start transplants indoors:</u> Broccoli, collards, kale <u>Transplant (mid-March):</u> Cabbage, lettuce <u>Direct seed (mid-March):</u> Carrots, peas, radishes, spinach	None	Work compost or other organic matter into the garden a week of two before planting, build trellis for peas, thin carrots and radishes (a few weeks after planting).
3	Parts of the Plant That We Eat	May	<u>Transplant:</u> Eggplant, peppers, tomatoes <u>Direct seed:</u> Beans, cucumbers, summer squash (note: cucumbers and squash can also be planted from transplants)	Lettuce, spinach, peas and radishes for "Plant Parts Salad"	Thin cucumbers and summer squash (a few weeks after planting), trellis tomatoes and cucumbers, general gardening maintenance.
4	Keep It Growing	June	<u>Transplant:</u> Sweet potatoes	Beans, broccoli, cucumbers kale, collards, summer squash to send home with students.	Water, weed, and mulch your garden.
5	Feed the Soil... and the Soil Will Feed You!	July	<u>Transplants (late July):</u> Broccoli, cabbage, cauliflower, collards, kale <u>Direct seed (late July):</u> Carrots	Cucumbers, peppers, tomatoes, and any other available vegetables for "Soil Salad" (send surplus home with students).	Pull out spent plants and make compost pile, mulch, work compost into fall vegetable beds as your plant; thin carrots (a few weeks after planting); general garden maintenance.
6	Healthy Harvest	August	<u>Direct seed:</u> Lettuce, radishes	Eggplant, garlic, peppers (sweet and hot), summer squash, and tomatoes for "Harvest Fajitas".	Thin radishes (a few weeks after planting); general garden maintenance.
7	Variety: The Spice of Life!	September	<u>Direct seed:</u> Spinach	Red bell peppers or tomatoes for "Confetti Spaghetti"; If planted in mid to late summer, you may also have red cabbage, cauliflower, and carrots for the recipe.	General garden maintenance.
8	What's So Great About Gardening?	October	<u>Direct seed:</u> Garlic Cover crop (late October)	Tomatoes for tomato taste test (you may complete the activity using any available garden vegetable to compare to grocery store vegetables).	General garden maintenance; harvest all summer vegetables and send home with students before first frost, sow cover crop seeds.
9	Garden Fitness is an extra unit that may be incorporated at anytime during the growing season.				

Cooking in the Classroom:

The thought of preparing food in the classroom with students can be intimidating. While managing a lot of little hands using tools and utensils may be challenging, it is well-worth the effort when students are willing to try new or unfamiliar foods because they invested in their preparation.

Classroom management: In general, being prepared is the best way to ensure that a cooking activity stays manageable. You may want to have all vegetables washed, and difficult vegetables (e.g. onions) already chopped and ready before the activity. Think about the different tasks involved in the preparation and how they can be divided among students so that everyone gets a chance to contribute. Keep students busy and minimize transition time. For example, when a student finishes chopping their kale, they can start collecting other students' cutting boards and knives as they finish.

Allergies: Before completing any food preparation activity, be sure you or the teacher are aware of any food allergies among the students. Lessons that include foods such as nuts contain an additional cautionary reminder. Work with the school nurse to determine student allergies and procedures within the school. It is recommended to have parents complete a form that describes any food sensitivities students may have before you begin the curriculum. If you are required by your principal or school, a parent letter requesting permission for student participation in the program, describing safety measures, and requesting allergy information, is provided in the Appendix.

Food safety: It is extremely important that food preparation is done with proper hygiene in mind. Keep a container of sanitizing wipes on hand to wipe down work surfaces before beginning food preparation. All students should wash hands thoroughly before beginning cooking activities. The steps to proper handwashing include:

1. Wet your hands with warm water
2. Apply soap
3. Rub your hands together including between your fingers and around fingernails for 20 seconds
4. Rinse thoroughly
5. Dry your hands using a paper towel

**REMEMBER TO
WASH YOUR HANDS**

In lessons involving food preparation, a reminder about proper handwashing is included in the lesson plan, and a handwashing icon is on the recipe to remind students and their families about the importance of clean hands in maintaining food safety. Hand sanitizing gels can be used for quick sanitizing if hands have touched unclean surfaces during food preparation, but preparing food should always be preceded with a soap-and-water handwashing.

Tasting etiquette: Many of the recipes in this curriculum will contain foods that are new or unfamiliar to your students. Before you prepare your first dish, be sure to discuss the rules for food tasting. Explain to students the many reasons why they should not react negatively to a food they are sampling: they, and many others, invested time and energy into its preparation, which should not be treated with disrespect; other students might like the dish and they should not try to influence other's opinions; and they might find that they enjoy the food later in life as their tastes change and develop.

Types of gardens: This curriculum can be complemented by a diversity of garden types, ranging from small container gardens to larger, in-ground gardens. Do not think that you have to create a large-scale “edible schoolyard” for the program to be effective; the lessons will have just as much weight if they are taught using a container garden comprised of five or six pots. In fact, small container gardens may be more relevant to what students can replicate at home. We always recommend that you start small, concentrating on implementing the lessons instead of building a large, maintenance-intensive garden.

Planning your garden: You will need to consider many things before starting a garden at your school. We have designed a Youth Gardening Program Planning table to help you brainstorm ideas to develop your program. This tool is intended to help initiate thoughts about the goals of your program, potential garden sites, as well as financial, physical and educational resources. This planning table can be found in the Appendix.

Support for the garden: If you will be developing the garden space that will complement this curriculum, it’s important that you start by recruiting support at your site. Find one or two other people that will share responsibility for coordinating the garden. Ask other teachers, parents, parent liaisons, or someone in the community to help the garden for teaching. Make sure you have the support of the school principal and administrators.

You don’t have to be the “garden guru” in order to grow vegetables at your school! Focus your energy on developing the program format, assessing and making use of available resources. There are lots of great gardening resources for teachers, including web resources, print materials, and knowledgeable volunteers who are available to help with details. Learn what’s available and use it! See the Appendix for a list of gardening resources and a planning document to help you identify and organize the resources that will get your gardening program off to a strong start.

Garden maintenance: We suggest designating after-school time for garden maintenance. Giving up valuable in-school instructional time for weeding and watering is not feasible or appropriate, and this strategy will likely result in an uncared for garden. While it is important that students who are exposed to the curriculum have the opportunity to reinforce that knowledge through planting, harvesting, and relevant maintenance, day-to-day maintenance is best displaced to non-school time. You will have to decide how and when your students will spend time in the garden independent of the time spent implementing these lessons.

Safety in the garden: Gardening and food preparation is a ton of fun, but it is extremely important to keep proper safety precautions in mind. The University of Maryland Extension’s “Grow it Eat it” program has created a Food and Garden Safety tool that is an excellent reference for school gardeners working with youth. This resource provides recommendations for garden locations and addresses everything from safe garden tool practices to proper food harvest and storage. A copy of the Food and Garden Safety document can be found in the Appendix.

It is important that your students have a clear understanding of the rules for working in the garden. A simple list of garden rules might include:

- No running.
- No raising tools above the waist.
- Do not use voices louder than would be used inside.
- Do not pick any plants unless given permission.

Working with youth in the garden: Before you get started, have a plan in mind for how you will engage lots of students in the process. Know your list of tasks and divide students into groups before you get out to the garden. With younger students, keeping things in control may require some additional structure, such as having students form lines and taking turns completing their tasks. Using tools such as marking flags or large rulers will help students plant at proper spacing and free you from having to guide each individual student.

And finally, it is important that you remain flexible. Gardening is always full of surprises and unanticipated teachable moments. Even a dead plant can be turned into an investigation of what happened, rather than a failed venture. Don't get discouraged when things don't work out as planned, have fun, and learn along with your students.