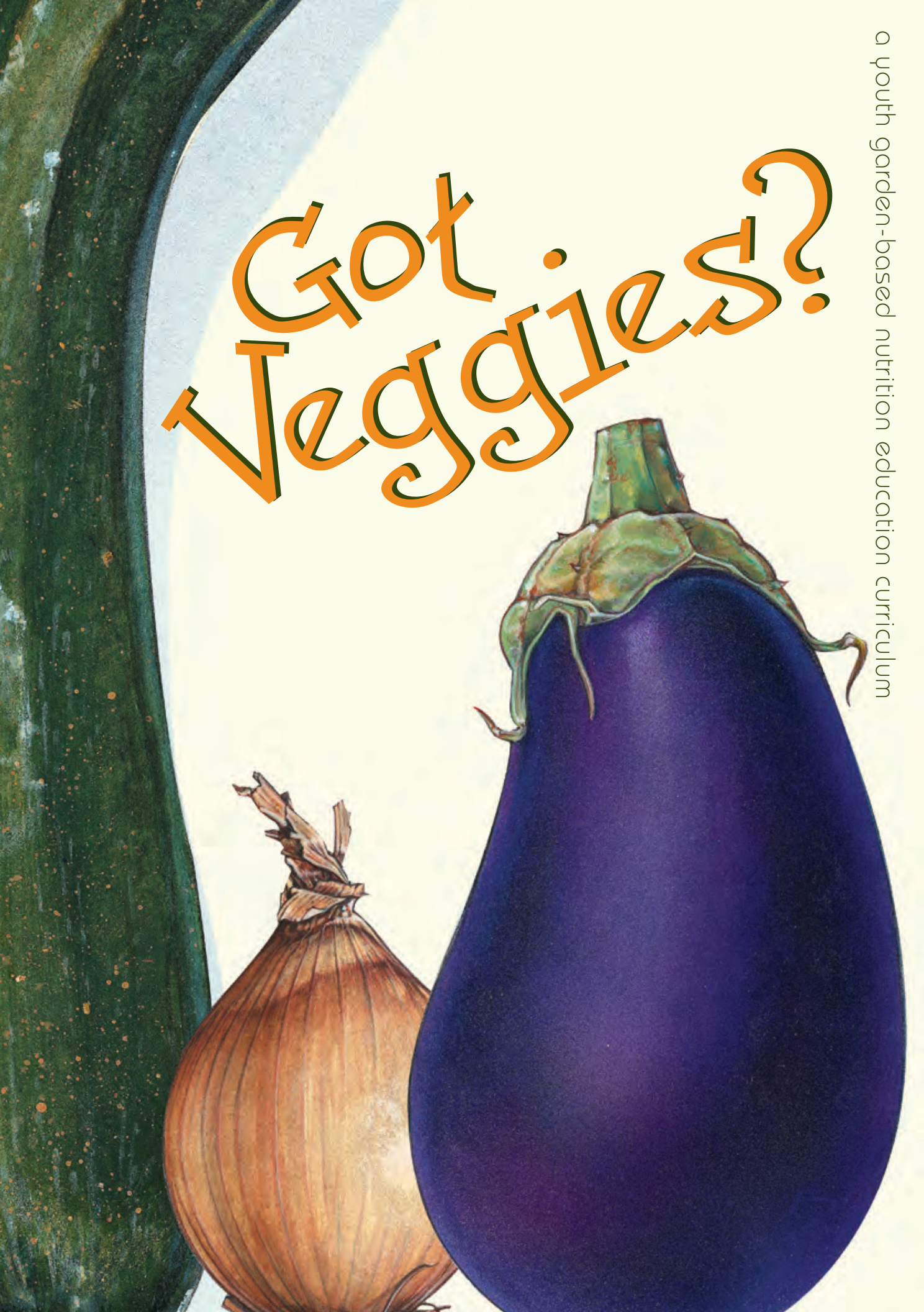
Got Veggies?

a youth garden-based nutrition education curriculum



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Foreword

I am thrilled to present Got Veggies?, a curriculum that combines the fun of gardening with nutrition education. Along with my partners at Community GroundWorks at Troy Gardens, Wisconsin Home Grown Lunch, University of Wisconsin-Cooperative Extension, and the Wisconsin Departments of Health Services and Public Instruction, I hope this inspires students, early childhood providers, and teachers.

Got Veggies? is a wonderful way to engage children (and adults) in actively taking control of their own health. As a pediatrician specializing in childhood obesity, I am confronted every day with the challenge of helping children keep their bodies strong and healthy. Consistent eating of vegetables and fruits has been shown to decrease obesity, heart disease and some cancers. Healthy eating habits need to start young, and be reinforced through peers, mentors, teachers, and parents. This resource is part of the Got Dirt? Garden Initiative which seeks to provide practical resources for starting youth gardens —which can be used as a place to educate, provide opportunities for physical activity, acquire a useful skill, and have lots of fun! Nutrition education combined with gardening is an effective way to increase knowledge of fruits and vegetables, as well as reinforce teachers' and students' exposure to gardens as part of the academic curriculum. I hope Got Veggies? will further inspire the creation and use of youth gardens, and nurture a love for fresh fruits and vegetables.

Got Veggies? has been a collaborative effort, and the hard work of many partners has been essential to this project. Just as in the tilling, planting, weeding and harvesting of an actual garden, a group effort brings the best results.

Happy growing!

Aaron Carrel, M.D.
Medical Director,
University of Wisconsin Pediatric Fitness Clinic

Introduction

What is Got Veggies?

Got Veggies? is a garden-based nutrition education curriculum. The primary goal of garden-based nutrition education is to get children to eat more fresh fruits and vegetables. Gardens have long provided an excellent learning environment for teaching children about scientific concepts such as photosynthesis and decomposition. What we have discovered in the past decade, however, is that the garden is also the perfect learning environment for nutrition education. Students learn about nutrition in the garden through direct experience. When provided an opportunity to grow and prepare food in the garden, youth forge a deeply personal relationship with the food that sustains them. For example, a broccoli floret becomes more than a commodity when it is linked to the plant that bore it; the rain, soil, air, and sunlight that fed it; and the children and adults who nurtured it from seed to harvest.

Why Got Veggies?

In 2005, the Wisconsin Department of Health Services and collaborating partners launched the Got Dirt? Garden Initiative with the goal of increasing the number of youth gardens in Wisconsin as a means for increasing access to, and consumption of, fruits and vegetables. A main part of the Initiative included the creation of the Got Dirt? Toolkit, which was developed to provide a step-by-step guide for starting a youth garden. Feedback gathered from educators across Wisconsin revealed the need for curriculum and activities that connect the classroom to the youth garden. Thus, Got Veggies? Garden-Based Nutrition Education Curriculum was developed for school, after school, and early childhood teachers to make that connection.

Growing evidence demonstrates that nutrition education used in conjunction with a youth garden positively impacts child and adolescent nutrition. In the midst of a national obesity epidemic, it has never been so important to support children in improving their eating and physical activity habits. The Centers for Disease Control and Prevention has identified both daily physical activity and increased fruit and vegetable consumption as two of the six most important strategies for preventing obesity. Thus, growing and eating food in the garden is a good place to start cultivating healthy eating and physical activity habits.

What is in Got Veggies?

Got Veggies? features seven full lesson plans in the Main Menu section. Each lesson plan includes an overview, list of objectives (correlated to Wisconsin Model Academic Standards for Nutrition, Health, Science, and other related subjects), materials list, and directions for lesson activities including tasting.

The À La Carte section offers a variety of garden-based activities including Keeping a Garden Journal, Theme Gardens, and Garden Art. The Cooking & Eating in the Garden section provides a collection of fun recipes and helpful tips from the Troy Kids' Garden. These garden-based lessons and activities can stand alone or be used in conjunction with each other. Whether you have just a few minutes to spend with students in the garden or an entire lesson period, this curriculum is a great way to nurture students' interest in growing and eating fresh fruits and vegetables. Got Veggies? also includes an annotated list of garden-based and nutrition education resources.

Stealth Health

As poor nutrition and lack of physical activity are central causes of childhood obesity, we need to find ways to make the healthy choice the easy choice for kids. How do we do this? We begin by finding ways to improve kids' environments, which includes where they live, learn, and play. Putting in a garden at a school, afterschool, or early childhood site is certainly changing their environment! Offering more fruits and vegetables with meals or adding healthier options to a vending machine are also good examples of things that can be done … all the while kids are unsuspecting of these changes you are making! When we change environments to support healthier eating and physical activity, we increase the likelihood that better choices can be made.

— Amy Meinen, Nutrition Coordinator
Wisconsin Department of Health Services

Youth Grow Local

When youth tend their food from seed to harvest, they are more adventurous about eating fresh fruits and vegetables. In the garden, children eagerly snack on a wide range of homegrown treats—such as spring garlic, broccoli, cucumbers, cherry tomatoes, and kohlrabi. By teaching young people how to grow their own food, they are introduced to the ultimate local food system. Young gardeners take on the dual role of grower and consumer. When presented in the proper way, growing and eating food in the garden is a particularly powerful way for youth to connect to nature. It allows them to witness first-hand the life-giving energy that flows from the Sun to a plant to one's own body. These types of garden learning opportunities have the power to change the way that youth commonly experience food. In the children's garden, the interpretation of food moves beyond that of a resource or commodity—it becomes a delicious symbol of life itself.

— Nathan Larson, Education Director
Community GroundWorks at Troy Gardens

What should I know about this curriculum?

Got Veggies? was developed for 2nd and 3rd grade students with attention to current Wisconsin Model Academic Standards, including those for nutrition education. These lessons and activities can be easily adapted for younger and older children. We encourage school, after school, and early childhood teachers to modify lessons and activities based on what is developmentally appropriate for different age groups.

This curriculum was developed for use in a garden learning environment. We understand that not every teacher has access to a garden, so many of these lessons can easily be adapted for use in the classroom. If your school, after school, or early childhood learning environment does not currently have a garden and you are interested in developing one, please visit www.dhs.wi.gov/health/physicalactivity/gotdirt.htm for more information and resources for starting a youth garden.

Can I evaluate the effectiveness of this curriculum?

If you wish to evaluate your students' progress based on the seven core lessons and short activities contained in this curriculum, we suggest the following:

- Consider collecting pre or baseline evaluation measures before beginning to use the curriculum and post measures after using the curriculum.
    - A pre/post measure might include documenting the change in knowledge about fruits and vegetables. Students could be asked questions about how many fruits and vegetables they should be eating each day or why dark orange and dark green vegetables are extra special.
    - Evaluation measures may include—but are not limited to—measuring change in students' knowledge of fruits and vegetables, willingness to try fruits and vegetables, and attitude toward or likeability of fruits and vegetables.

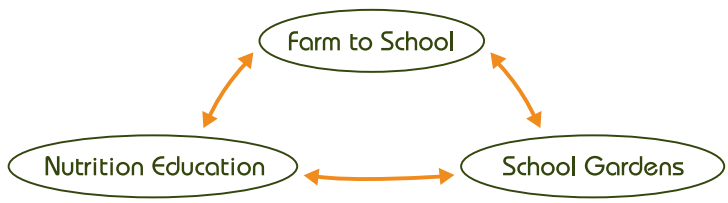
There are other ways to evaluate the success of your garden program, including use of the following techniques:

- Photo journaling—taking pictures of the students gardening and of the garden as it grows.
- Journaling—keeping a log of student observations of the gardening experience including their feedback on trying new fruits and vegetables.

Gardening & Farm to School

As the farm to school movement grows, schools are beginning to procure more foods (including fruits and vegetables) locally for use in school meals and snacks. Gardening is a great addition to farm to school efforts! As new varieties of local fruits and vegetables begin to appear in school lunches across the country, children may be reluctant to try these new items. However, if children learn about how their food grows or where it comes from through gardening and nutrition education, they may be more accepting of and willing to try new foods. Thus, when creating a comprehensive farm to school program within your school, after school program, or early childhood learning environment, consider using the Got Dirt? Garden Toolkit and Got Veggies?.

A Comprehensive Farm-to-School Program:



The Main Menu

Lesson Plans

The Color Harvest

A Comparative Tasting Lesson

Lesson Overview

This comparative harvesting, cooking, and eating activity is a fun way to familiarize students with a variety of fruits and vegetables using color as the distinguishing characteristic. Eating a variety of colors is important as this gives our bodies a wide range of valuable nutrients—like fiber, folate, potassium, and vitamins A and C. For this lesson, you will want to harvest an assortment of seasonal foods from your garden and compare their colors and other characteristics. The lesson is suited for the garden or the classroom and if you don't have enough food in the garden you can get a colorful variety of fruits and vegetables at a local farmers' market, farm stand, or grocery store. Students will learn how eating different colors of foods makes us healthy in different ways. They are encouraged to use specific vocabulary to describe color variations between vegetables and fruits. This lesson can be adapted for students of all ages. See some suggestions for different age groups on page 12.

Objectives

Students will:

1. Taste and identify a variety of fruits and vegetables (Nutrition Ed C.4.2, F.4.2)
2. Understand that some plants are sources of food (Ag Ed D.4.1; Nutrition Ed F.4.3)
3. Develop descriptive vocabulary for specific characteristics of food (Lang Arts D.4.1, D.4.2; Nutrition Ed F.4.2)
4. Collect and analyze data – see Review and Vote (Math E.4.1, E.4.3)

Materials

Food:

- Different varieties of vegetables and fruits that represent a spectrum of colors from your garden or local market (e.g., *orange*: carrots, sweet potatoes, butternut squash, pumpkin; *purple*: grapes, eggplant, kohlrabi; *red*: radishes, tomatoes, red peppers, strawberries, raspberries, apples, watermelon; *yellow*: carrots, corn, potatoes, summer squash; *green*: collard greens, asparagus, kale, broccoli, peas, zucchini, celery, spinach, cucumbers; *white*: cauliflower, white potatoes; *blue*: blueberries).

Supplies:

- Book: *Growing Vegetable Soup* by Lois Ehlert or other book to stimulate discussion about growing and eating a variety of vegetables and fruits from your garden. For more book suggestions, consult the Booklists on page 58 in the Resources section.
- Knife
- Cutting board
- Plates
- Word Bank (included at end of lesson)
- Tasting Chart (included at end of lesson)

Preparation

1. Prior to lesson, determine which vegetables and fruits you will need to harvest or purchase to demonstrate the variety of colors we eat. Consult the list of suggested vegetables and fruits under the Food heading in the Materials section above. For more ideas, visit Harvest of the Month at www.harvestofthemonth.com or MyPyramid.gov for lists of different fruits and vegetables. For vegetables, visit: www.mypyramid.gov/pyramid/vegetables.html. For fruits, visit: www.mypyramid.gov/pyramid/fruits.html.

2. Get *Growing Vegetable Soup* by Lois Ehlert or similar book to stimulate discussion about growing and eating a variety of vegetables and fruits from your garden. For more book suggestions, consult the Booklists on page 58 in the Resources section.

the garden classroom

A healthy school garden is a critical component of a vibrant nutrition education. Bringing nutrition education from the classroom into the garden setting has a powerful effect on children's eating habits now and into their future. The Kids' Garden has provided us at Mendota Elementary School the opportunity to develop our nutritional senses and flourish in the benefits of healthy lifestyle choices. The kids love to eat the vegetables they learn about and are delighted to work hard harvesting, washing and hauling the newly grown treasures.

— Christine Pietruszka, Teacher at Mendota Elementary School, Madison Metropolitan School District

3. Rinse vegetables and fruits before slicing. If possible, slice immediately before tasting to preserve freshness. Avoid putting food in the refrigerator, as it dulls the flavor and changes the texture.

4. Write the name of each vegetable or fruit on a display board or poster to record student descriptions (refer to Tasting Chart at end of lesson).

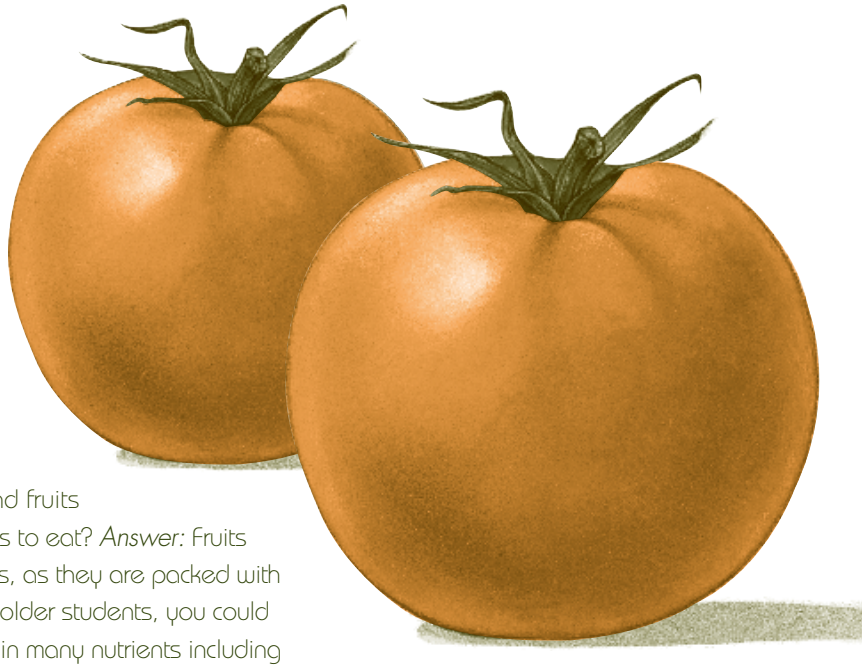
5. Post Word Bank with adjectives to guide students' sensory observations (included at end of lesson).

Procedure

Introduction: Gather students for a discussion or a read-aloud. Use *Growing Vegetable Soup* by Lois Ehlert or similar book to stimulate discussion about growing and eating a variety of vegetables and fruits from your garden.

You may choose to use some of the following questions to guide your discussion:

1. Where does food come from?
2. Who has a garden or knows someone with a garden? What do you grow?
3. Who has been to a farm? What did you see there?
4. Can you think of some vegetables that are grown in a garden or on a farm?
5. Can you think of some fruits that are grown in a garden or on a farm?
6. Who has tasted any of these fruits or vegetables before?
7. Which fruits do you like to eat as a snack?
8. Which vegetables do you like to eat as a snack?
9. Do you grow any of these vegetables or fruits with your family?
10. Can you think of a fruit or vegetable that comes in more than one color? For example, tomatoes come in almost every color as well as in many shapes and sizes.
11. What colors and shapes of tomatoes have you seen?



12. How do these different vegetables and fruits help us grow? Why are they good for us to eat? *Answer:* Fruits and vegetables are good for our bodies, as they are packed with nutrients like vitamins and minerals! For older students, you could explain that fruits and vegetables contain many nutrients including vitamin A and C, potassium, and dietary fiber. There are also some special fruits and vegetables, called the "super green and super orange." These dark green and orange vegetables are important to eat often because they contain extra amounts of vitamins and minerals. Can you guess which fruits and vegetables growing in your garden are green or orange superheroes? *Answer:* Super green: bok choy, broccoli, collard greens, mustard greens, romaine lettuce, spinach, kale, watercress, turnip greens, mesclun, and dark green leafy lettuce. Super orange: acorn squash, pumpkin, carrots, sweet potatoes, butternut squash, and hubbard squash.

13. Do you know how many fruits and vegetables you should be eating each day? *Answer:* The amount we should eat depends on if we are a boy or a girl, how much activity we get each day, and how old we are. Have children try the Fruit and Veggie Calculator at www.fruitsandveggiesmorematters.gov or visit www.fruitsandveggiesmorematters.gov/downloads/Low_Literacy_Brochure.pdf for information on how many fruits and vegetables kids should be eating daily. As their teacher, how many fruits and vegetables should you be eating? Compare the recommended amounts for adults and kids.

Following the introduction, review proper hand washing procedures and discuss why they are important. Have students wash their hands. Prepare selected fruits and vegetables for tasting.

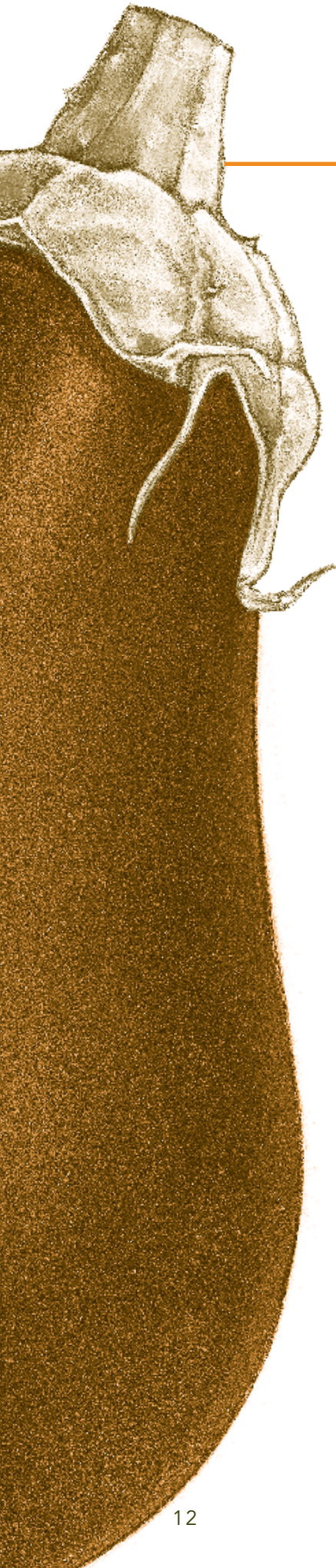
Observation: Write names of selected fruits and vegetables on the display board or poster paper, or for older students, hand out Tasting Charts (see example on page 13). Explain to students that they will be acting as investigators and will be using their senses to observe, describe, and compare different fruits and vegetables. Before tasting, pass around each vegetable or fruit so students can observe the appearance, texture, scent, etc.

voices from the Kids' garden

"How many types of these are there in the world?" a girl asked while planting two varieties of kale in the Kids' Garden.

After harvesting a broccoli floret and taking a bite, a child exclaimed, "Yum! Wait, I thought broccoli was gross!"

"It's interesting, salsa has everything in it that I didn't like, but I like it. I mean, it has onion, tomatoes, peppers ... but it tastes good!"



Tasting: Give each student a slice of vegetable or fruit. Encourage them to taste it. Tell students that you don't expect everyone to like it, but it is important to try new vegetables and fruits because they may develop a taste for them over time. Have them observe and describe it using words from the Word Bank. Encourage students to use their own words, which can be added to the Word Bank for future sensory observation activities. Record student descriptions on the display board or have them write them on their Tasting Chart. Repeat these steps with each different vegetable or fruit. Encourage your students to use specific and descriptive vocabulary.

Review and Vote: Briefly review and compare vegetable and fruit descriptions. Have students vote for their favorite variety. This could be an opportunity for a math connection. Count the votes and create a graph or chart to represent the results. Discuss voting results and reasons why students chose one fruit or vegetable over others.

Clean-up: Have students help with clean-up and wash their hands. If possible, vegetable and fruit scraps can go to a compost pile or worm bin.

Individualized to Age Groups

For Younger Children (K to 2nd grade): During observations have students draw a picture of one of the vegetable or fruit varieties. Or cut vegetable shapes out of paper and write their descriptive words on the vegetable. Another fun activity is to have each student offer one descriptive word and combine them to make a collective poem about a selected vegetable or fruit.

For Older Children (3rd to 5th grade): Use the attached Tasting Chart for students to record their own observations. Students may choose adjectives from the Word Bank or use their own describing words. You may also have students write a paragraph or poem describing their favorite vegetable or fruit. Cut fruit or vegetable shapes out of paper and have students write their poems on them. Glue all the poems to one large piece of paper or poster board.

Lesson Variation: Comparative Heirloom Vegetable or Fruit Tasting: Hone your students' taste buds and observation skills by repeating this lesson with heirloom varieties of just one vegetable or fruit. For example, harvest or purchase four different heirloom varieties of tomatoes or apples. Heirloom varieties of certain vegetables and fruits—such as tomatoes and apples—vary greatly in appearance, texture, and flavor, making them well suited for comparison.

Additional Activities

Give students a list of foods being grown in the garden or found at their local market. Have them work with a parent/caregiver to find a word describing a characteristic of each food on the list. Encourage the parent/caregiver to offer one or more of these foods at meals or snacks.

Fruit and Vegetable Challenge: Keep track of how many fruits and vegetables you eat for a week.

Compare food in different forms. Make some garden salsa and compare it to raw tomatoes, tomato soup, ketchup, or sun-dried tomatoes. Compare raw apples with unsweetened applesauce and dried apples. Ask students how they think apples are turned into applesauce or dried apples.

Word Bank

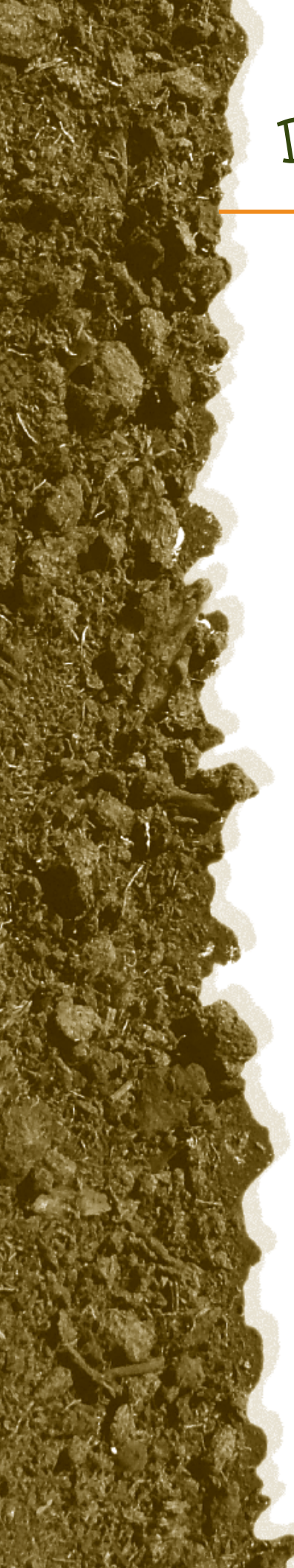
sweet	sour	flavorful	earthy
yummy	sharp	squishy	zesty
grand	healthy	zippy	mealy
delicious	ripe	tasty	firm
fragrant	tangy	acidic	crunchy
bitter	juicy	delectable	tough

TASTING CHART				
Name of Fruit or Vegetable				
Look				
Smell				
Feel				
Taste				
Sound				

garden observations

It's so inspiring to watch the garden transform so many kids over the course of a season! Kids who arrive to the garden saying they "don't like vegetables" will be begging for seconds of freshly picked carrots just a few weeks later. They start to love the adventure of trying new things, and they start teaching each other about how crunchy kohlrabi is or how to wrap a cherry tomato in a cabbage leaf. The garden is the first place where a lot of the kids have the chance to develop a positive, respectful relationship with both food and nature, and I've seen the pride in their faces when they show off what they've grown to their teachers and peers.

— V. Ione Machen,
Garden Educator,
Community GroundWorks
at Troy Gardens



Dirt Made Our Lunch*

Lesson Overview

This lesson is designed to teach students about the connection between soil and food. The central activity, Deconstructing a Cheeseburger, asks students to help trace ingredients back to the soil, showing how we depend on healthy soil in order to eat. Many of the nutrients in soil come from decomposition of dead plants and other organic matter. Plants absorb these nutrients, and in turn, our bodies absorb them when we eat plants. We refer to this as the nutrient cycle. The Lunch Makes Our Dirt activity helps students understand how food scraps and plant matter break down into rich soil.

Objectives

Students will:

1. Trace foods from origin to table
   (Ag Ed D.4.1; Nutrition Ed B.4.4; Science F.4.4)
2. Describe the connection between healthy soil and healthy food
   (Ag Ed D.4.1; Science F.4.2, F.4.4)
3. Understand that people need food in order to be healthy, have energy, and grow (Nutrition Ed A.4.3)
4. Determine the difference between plant and animal food sources
   (Nutrition Ed F.4.3)
5. Identify the basic food groups and give examples from each
   (Nutrition Ed F.4.4)

Materials

Food:

- Dill, cucumbers, mustard seed, peppercorns, vinegar, water and salt. See Kids' Garden Refrigerator Pickles recipe listed in the Tasting activity on page 17.

* Lesson inspired by "Dirt Made My Lunch," a song by "Solar" Steve Van Zandt of the Banana Slug String Band.

Supplies:

- Photos or drawings that illustrate how common cheeseburger ingredients can be traced back to the soil (e.g., bun, wheat, soil. See Deconstructing a Cheeseburger activity on page 16 for full list of images needed).
- Garden journals or paper
- Pens/pencils
- Display board
- Plates
- Napkins
- Cutting boards
- Bowl
- Knives
- 2 quart-sized Mason jars or similar sized plastic containers with lids

Preparation

1. Familiarize yourself with "Dirt Made My Lunch," a fun and educational song by "Solar" Steve Van Zandt of the Banana Slug String Band. To watch a video of the Banana Slug String Band singing "Dirt Made My Lunch," go to www.youtube.com/watch?v=SCeyXW64cns. To watch youth gardeners from Troy Gardens in Madison, Wisconsin singing this song, go to www.youtube.com/watch?v=ZrieCG8D2WI&feature=youtube_gdata. You can order songbooks and CDs of many great educational garden and nature songs, including "Dirt Made My Lunch," from the Banana Slug String Band at www.bananaslugstringband.com.

2. Get photos or drawings that illustrate how common cheeseburger ingredients can be traced back to the soil (e.g., bun, wheat, soil. See Deconstructing a Cheeseburger activity for full list of images needed).

3. Collect pens or pencils and make or purchase garden journals for the Lunch Makes Our Dirt activity. See Keeping a Garden Journal on page 38 in the À La Carte section for garden journal ideas.

4. Harvest or purchase – and wash – food for Kids' Garden Refrigerator Pickles recipe listed in the Tasting activity.

reciprocal nature of gardening

Gardening is a gateway to healthy eating. When children have the opportunity to experience how food connects us to the natural world they are much more willing to try and enjoy new fruits and vegetables. The reciprocal relationship of nurturing plants so that they in turn can nurture us with food is a marvelous and powerful thing to take part in.

— Brent Kramer,
Education Coordinator,
Wisconsin Homegrown Lunch
REAP Food Group

fun idea

Emphasize the concept of the nutrient cycle by feeding plants in your garden. Encourage students to use their hands to place compost or other nutrient-rich soil at the base of a plant and say "Bon Appétit!"

Procedure

Song – Dirt Made My Lunch. Sing along with "Dirt Made My Lunch" by "Solar" Steve Van Zandt of the Banana Slug String Band.

Introduction: Briefly discuss the importance of soil with a series of questions: Could we have plants without dirt? Could we have food without plants? Could we have food without dirt? If doing this lesson in the garden, have students scoop up a handful of dirt and examine it during this discussion. Leave questions open-ended as a set-up for using the Deconstructing a Cheeseburger activity to prove that "dirt made our lunch!"

Deconstructing a Cheeseburger

Students help prove how "dirt made our lunch."
Draw columns on a display board for several cheeseburger ingredients and place the appropriate image at the top of the column (bun, burger, cheese, pickle, tomato, and avocado). Then, taking one cheeseburger ingredient at a time, challenge the class to trace each ingredient back to the soil. Hand out images for students to post on the display board as you connect each ingredient to the soil. For example, the cheese pictures would include cheese, milk, cow, grass, and soil. For a pickle, use a picture of a pickle at the top of the column and then a bottle of vinegar, cucumber, a cucumber plant, a dill plant, and soil. Here's an example of the chart:

BUN	BURGER	CHEESE	PICKLE	TOMATO	AVOCADO
Flour	Beef	Milk	Vinegar	Tomato Plant	Avocado Tree
Wheat	Cow	Cow	Cucumber	Soil	Soil
Soil	Grass	Grass	Cucumber Plant		
	Soil	Soil	Dill Plant		
			Soil		

Lunch Makes Our Dirt. Look for stages of decomposition in your garden and/or compost pile. For example, follow the decomposition of overripe fruits and vegetables periodically (e.g., 3 days, 3 weeks, 3 months) throughout the season or of a carved pumpkin after Halloween. Have students document the stages using photos or garden journals. See Keeping a Garden Journal on page 38 in the À La Carte section for garden journal ideas.

If you are doing this in a classroom and don't have a school compost pile, bring in some items in various stages of decomposition from your home compost pile. Use recycled clear plastic containers or paper plates to demonstrate several decomposition stages. Or start a school composting project! You can also compost in a bag. Put food scraps, dried leaves, small plant parts, etc. in a zip top bag, mist with water and watch the process of decomposition take place.

Tasting. Remember to have students wash or sanitize their hands. Make fresh pickles with cucumbers from your garden or local market following the Kids' Garden Refrigerator Pickles recipe below. See the Cooking & Eating in the Garden section on page 47 for additional tips for this and other recipes.

Kids' Garden Refrigerator Pickles

Pickle recipe can also be found on page 50.

Supplies:

- Two quart size jars with lids
- 1 cup dill (flowers, seeds, and stems all work)
- 5-6 medium cucumbers
- 4 pinches of mustard seed
- 6 black peppercorns
- ½ cup of vinegar
- 2 cups of water
- 8 teaspoons salt

Harvest, wash, and slice the cucumbers into wedges. Place them in a bowl with the dill and salt, and mix them by hand or with a mixing spoon. Using two mason jars, add to each 2 pinches of mustard seed, 3 peppercorns, ¼ cup of vinegar, and one cup of water. Add half of the dill/salt/cucumber mixture to each jar. Seal the lid and mix the pickles until you can't wait any longer to eat them (minimum 10 minutes). If you have leftovers, check with your local food safety specialist to see how long they keep.

For Younger Children (Pre K): Have students color in the MyPyramid to match the ingredients of the cheeseburger. Orange: Bun (Grains), Green: Tomato and Pickle (Vegetables), Red: Avocado (Fruit), Blue: Cheese (Milk/Dairy), Purple: Burger (Meat and Beans). You can find MyPyramid at www.mypyramid.gov.

For Older Children (3rd to 5th grade): Have students match the cheeseburger ingredients to the appropriate MyPyramid food groups. Of the foods we eat, ask students to identify which of them are plants or parts of a plant? You can find MyPyramid at www.mypyramid.gov.

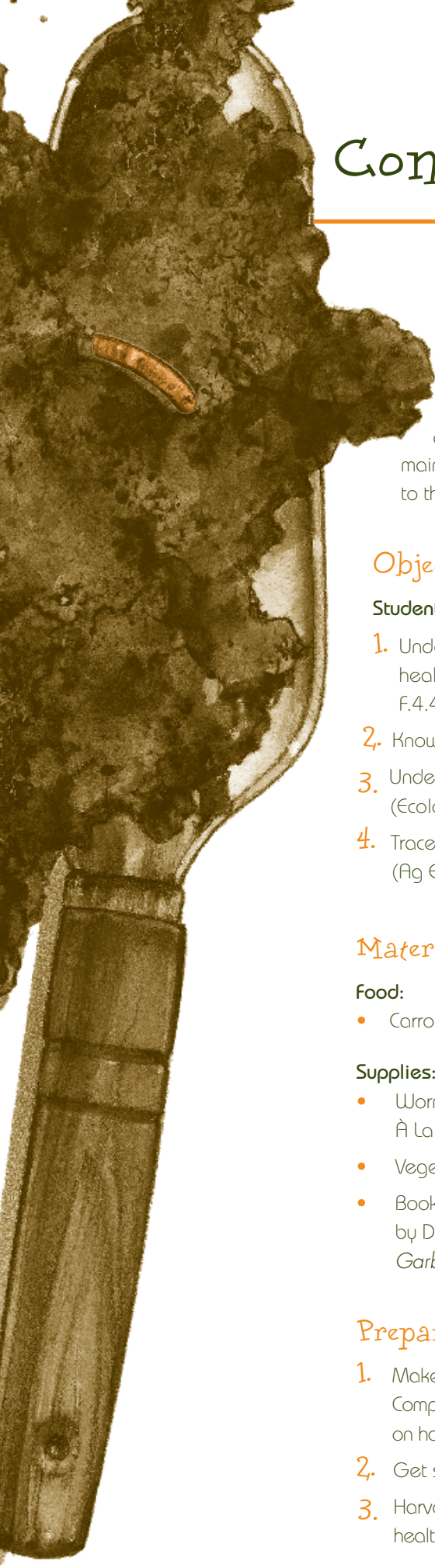
Take Home Activity

Give students another common food to deconstruct (e.g., peanut butter and jelly sandwich, spring roll, pizza, burrito, chips and salsa). Have them demonstrate how to do this activity for their parents/caregivers. Follow up the next day with a discussion about how to make healthy versions of foods like pizza. For example, make pizza with a whole-wheat crust, increase the amount of vegetables, and decrease the amount of meat. Or make burritos with less meat and cheese and more vegetables (e.g., zucchini, onions, garlic, shredded carrot, mashed sweet potato or butternut squash, lettuce, tomatoes, beans).

cross curriculum benefits

There are so many ways that you can apply what we do in the garden in the classroom. There's integration all throughout the curriculum: mathematics, science, art, music. And to see them realize "Oh, this thing that I saw last week is now this much bigger or it moved from this flower and now it's creating, what? What it is creating? Oh it's creating a tomato, it's creating a zucchini, it's creating—whatever." That is thrilling to see happen; to see that realization come over kids. There's the stark contrast of seeds sitting on stalks in the middle of winter, as well as the compost that's out there decomposing and creating heat; you can measure the heat, you can see the snow melting from the top. It can be an all year process—it's just wonderful that way.

— Ken Swift, Teacher, Lapham Elementary School, Madison Metropolitan School District



Composting with Worms

Lesson Overview

This lesson is designed to explore the nutrient cycle concept that students were exposed to in the Dirt Made Our Lunch lesson and to reinforce the idea that our food comes from the soil. Use worm composting as an interactive way to demonstrate the importance of maintaining healthy soil—which keeps us healthy—and introduce students to the significance of worms in this process.

Objectives

Students will:

1. Understand the nutrient cycle and the connection between healthy soils, healthy food and healthy people (Nutrition Ed B.4.5; Science E.4.2, F.4.3, F.4.4, H.4.3; Ecology/Environment E.4.1; Ag Ed D.4.1)
2. Know the function of roots (Science C.4.2, F.4.1, F.4.4)
3. Understand how plants collect and create nutrients people need (Ecology/Environment E.4.1; Health A.4.3; Science C.4.2)
4. Trace foods from origin to table (Ag Ed D.4.1; Nutrition Ed B.4.4; Science F.4.4)

Materials

Food:

- Carrot sticks, apple slices, or some other healthy vegetable or fruit snack

Supplies:

- Worm Bin (see Making Your Own Worm Composting Bin on page 44 in the À La Carte section for instructions)
- Vegetable peeler or apple slicer
- Books: *Wonderful Worms* by Linda Glaser (for K-2/3), *Diary of a Worm* by Doreen Cronin (for 3-5), *Compost* by Linda Glaser, *Worms Eat Our Garbage* by Mary Appelhof, Mary Frances Fenton, and Barbara Loss Harris

Preparation

1. Make a garden or classroom worm bin. See Making Your Own Worm Composting Bin activity on page 44 in the À La Carte section for instructions on how to make a worm bin.
2. Get suggested book(s).
3. Harvest or purchase – and wash – carrots and/or apples (or some other healthy vegetable or fruit snack). Cut carrots into sticks and apples into slices.

Procedure

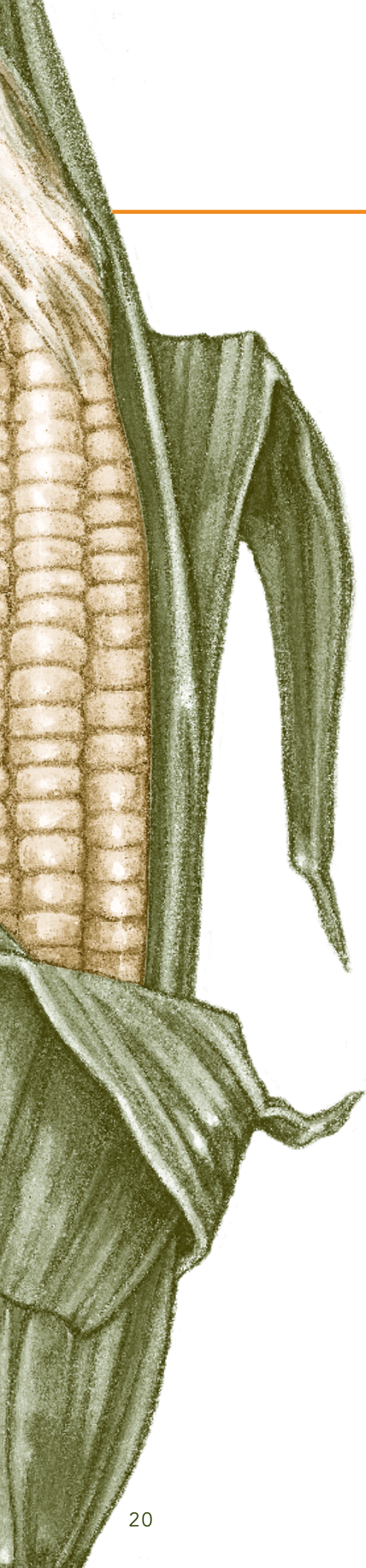
Introduction: Begin the lesson by handing out a healthy snack such as apple slices and/or carrot sticks. Remember to have students wash or sanitize their hands before tasting. While students are snacking, begin a discussion about the nutrient cycle.

Let the students know that today's lesson is about worms. Ask why they might be eating a snack during a worm lesson? What do apples or carrots have to do with worms? To answer this question, start by imagining an apple tree growing in the ground. Have the class brainstorm everything they know about the apple tree. Lead the discussion with questions about the roots, getting the students to think about the roots drawing nutrients from the soil, and then the trunk "sucking" those nutrients up into the rest of the tree and into the apples themselves. If we eat an apple from that tree, then where do the nutrients go? *Answer:* Into our bodies. Where did the nutrients from the apple come from? *Answer:* The soil. But how did they get into the soil in the first place? *Answer:* Small animals like worms play a big role in breaking down organic material like apple cores and carrot tops and returning nutrients to the soil. Next, read one or more of the books about worms. You may want to introduce some fun facts (see sidebar) before or during the Worm Bin Exploration.

Worm Bin Exploration. Before students begin exploring, make sure to mention two worm handling tips: (1) Keep your hands open, so that the worms can breathe; (2) If they start wriggling a lot, they are probably too warm or dry and they need to go back into the cool, moist bin. Ask the students to make guesses about what they will see when the worm bin is opened. You may also want to share some photos of what they might discover in the worm bin (e.g., worm cocoons). See Life Lab's Worm Bin Bingo page for some good photos, www.lifelab.org/wormbingo.php. Smaller classes of about 15 students can successfully stand in a circle around the worm bin, and get a chance to see the bin all at the same time. With larger classes, the class may be divided into two groups: one to see the bin, and one to observe some individual worms, separated out from the worm bin. Extra adult help in the classroom is useful during this part of the lesson. Students may also choose to feed the worms with the scraps from their own snack. Apple cores and carrot peels are both good worm snacks. This reinforces the idea of the nutrient cycle. The worms will help put the nutrients from the food back into the soil, so that more apple trees or carrot plants can grow. Students have fun with the idea that worm poop is healthy soil that helps plants grow. Encourage the students to say something to the worms as they feed them, such as, "Thanks, worms, for turning this back into soil."

fun worm facts

- Worms do not have eyes, ears, nose, or bones!
- Although they have no eyes, they are able to sense light and dark, and they prefer to be in the dark.
- Worms have five hearts!
- All worms are both male and female (hermaphroditic), and can mate with any other worm.
- Worms breathe through their skin!
- It is a myth that if you cut a worm in half both sides will survive; only the side with the five hearts will survive.
- Worms' tunnels loosen up the soil and bring air pockets into the soil, which are important for plant roots to grow.
- Worm poop is very rich soil!



Seeds & Sprouts

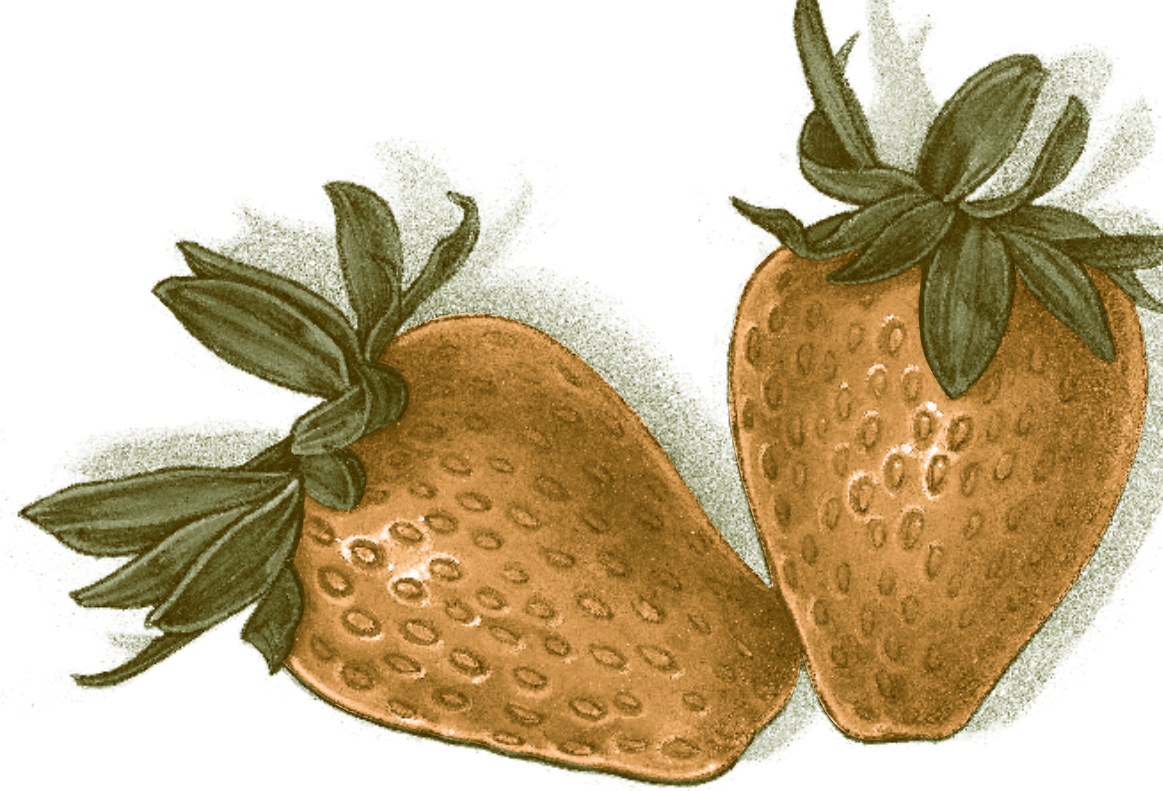
Lesson Overview

There are six main plant parts that people eat—seeds, roots, stems, leaves, flowers, and fruit. The following edible examples represent the six plant parts: bean (seed), carrot (root), asparagus (stem), spinach (leaf), broccoli (flower), and apple (fruit). This lesson is the first in a series of four Got Veggies? lessons that focus on the six main plant parts that we eat. It can be run in the garden or indoor classroom. This lesson also continues an ongoing investigation of the nutrient cycle that we began in Dirt Made Our Lunch. Guiding questions include: What do plants need to live and grow? How do plants help us live and grow? Where do nutrients come from and how do they get into our food? The answers to these questions can be found in explorations of plant development, the six plant parts we eat, and decomposition.

Objectives

Students will:

1. Identify what plants and people need to live and grow (Environmental Ed B.4.6; Nutrition Ed A.4.3; Science F.4.2, F.4.4)
2. Describe basic plant anatomy (Agricultural Ed D.4.1; Science F.4.3)
3. Understand connections between plants, people, and our natural environment (Science F.4.4)
4. Participate in a discussion (Lang Arts C.4.3)
5. Trace food from origin to table (Nutrition Ed B.4.4)



Materials

Food:

- A fresh seed snack from the garden (e.g., green beans, peas. See Tasting activity on page 23 for more suggestions)

Supplies:

- Spray bottle(s) with water
- A bucket filled with soil or brown paper towels (to represent soil)
- A paper fan, piece of cardboard, bellows, or something that can simulate wind

Preparation

1. Prepare a spray bottle filled with water, a bucket filled with soil, and a fan for the Plant Role Play activity.
2. Harvest or purchase – and wash – foods for the Tasting activity (e.g., green beans, peas. See Tasting activity on page 23 for more suggestions).

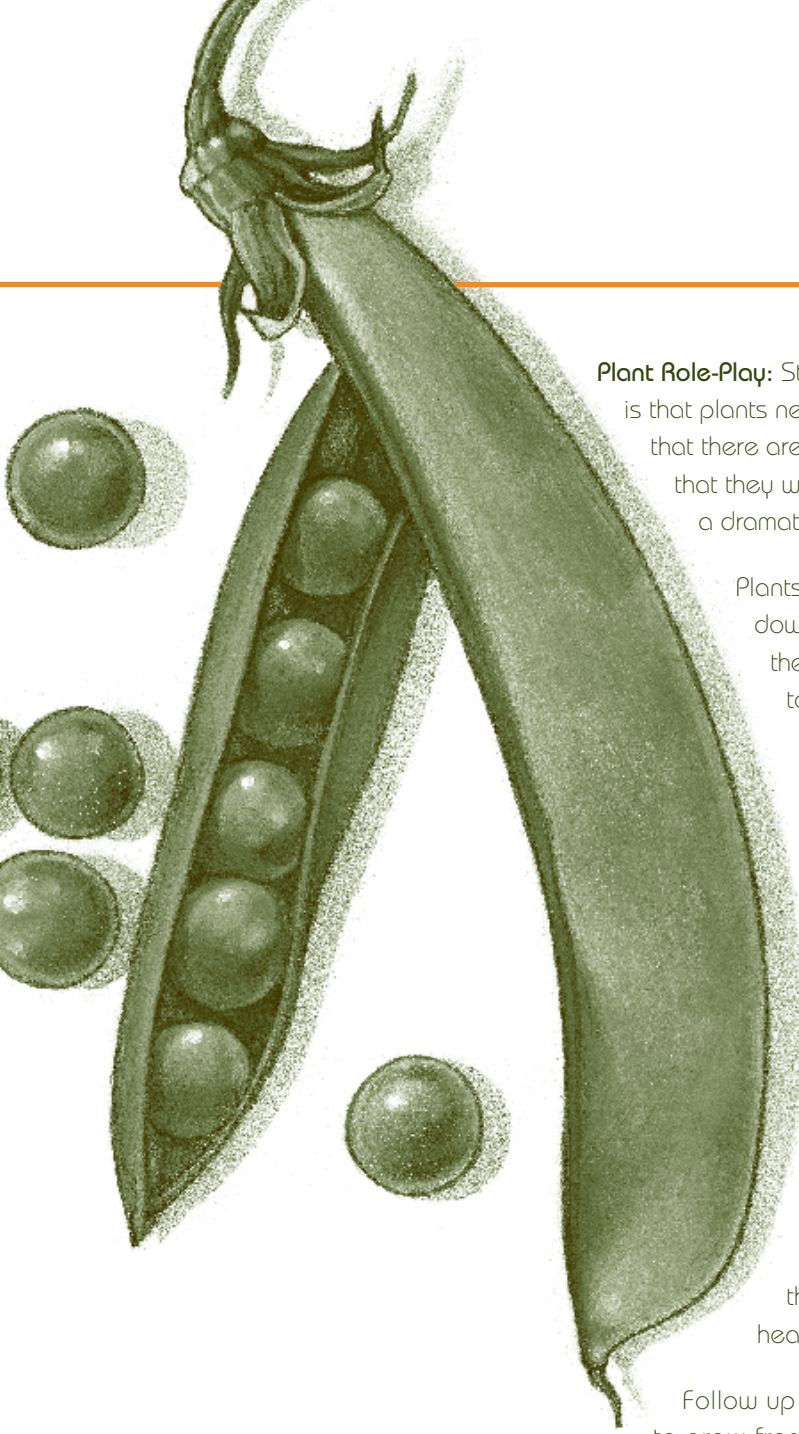
Procedure

Introduction: In order to introduce students to the connection between plants, people, and the environment, briefly discuss how plants help people by providing something healthy for us to eat. Our bodies are healthy when we eat nutritious foods. Then discuss how people—through farming and gardening—help plants to grow and be healthy. What can we do to help plants grow and produce food? We often begin by planting a seed. We can help that seed sprout and grow by helping it get the things it needs (e.g., water, nutrient-rich soil). Nature provides the basic things plants need to grow, as students learn in the following activity.

voices from the Kids' garden

After observing the pepper he planted the previous week, a child exclaimed: "Look! The plant I planted growed!"

"This is why I want to bring my mom here. You grow the food and then it tastes so good!"



Plant Role-Play: Students become plants in order to learn what it is that plants need to grow and be healthy. We tell students that there are elements of nature that help plants grow and that they will discover what those elements are through a dramatic play activity.

Plants start as seeds, so ask students to crouch down and become a seed. Ask students to close their eyes, or turn off the lights if in the classroom, to simulate a seed that is buried in the ground. First, give students a small handful of soil, a piece of brown paper towel, or something else to represent soil. They should hold the soil as they crouch. Next, go around with a spray bottle and give all "seeds" a light misting of water. After receiving the water, encourage students to raise a hand in the air to simulate a seed sprouting through the soil. Following the water, have students open their eyes (or turn on the lights in the classroom) to receive sunlight. Tell students to rise a bit from the ground to demonstrate that they are growing. Finally, use a small paper fan (or some other representation of wind) to blow air on students, after which they can stand up to represent a full-grown and healthy plant.

Follow up by asking students what they needed to grow from a seed to a mature, healthy plant. *Answer*: Sun, Soil, Water, and Air.

Chant: To reinforce what students learned in the role-play, they chant together, "Sun, Soil, Water, and Air! Everything we eat, and everything we wear, comes from Sun, Soil, Water and Air!" Begin chanting slowly and gradually pick up the tempo. Finish by slowing down and lowering voices to a whisper.

Tasting: Remember to have students wash or sanitize their hands. Serve a seed snack harvested from the garden or purchased from your local market—fresh green beans or peas make a great healthy snack. Other delicious seed and seeded fruit snacks from the garden include corn, sunflower seeds, grapes, cherry tomatoes and many varieties of berries such as raspberries and strawberries. Roasted pumpkin seeds, homegrown popcorn, and fennel seeds are favorite fall treats!

Additional Activities

Document the growth of a tomato, squash, or bean plant by using garden journals or taking photos: This is a fun way to follow the development of plants from seed to fruit. See Keeping a Garden Journal activity on page 38 in the À La Carte section.

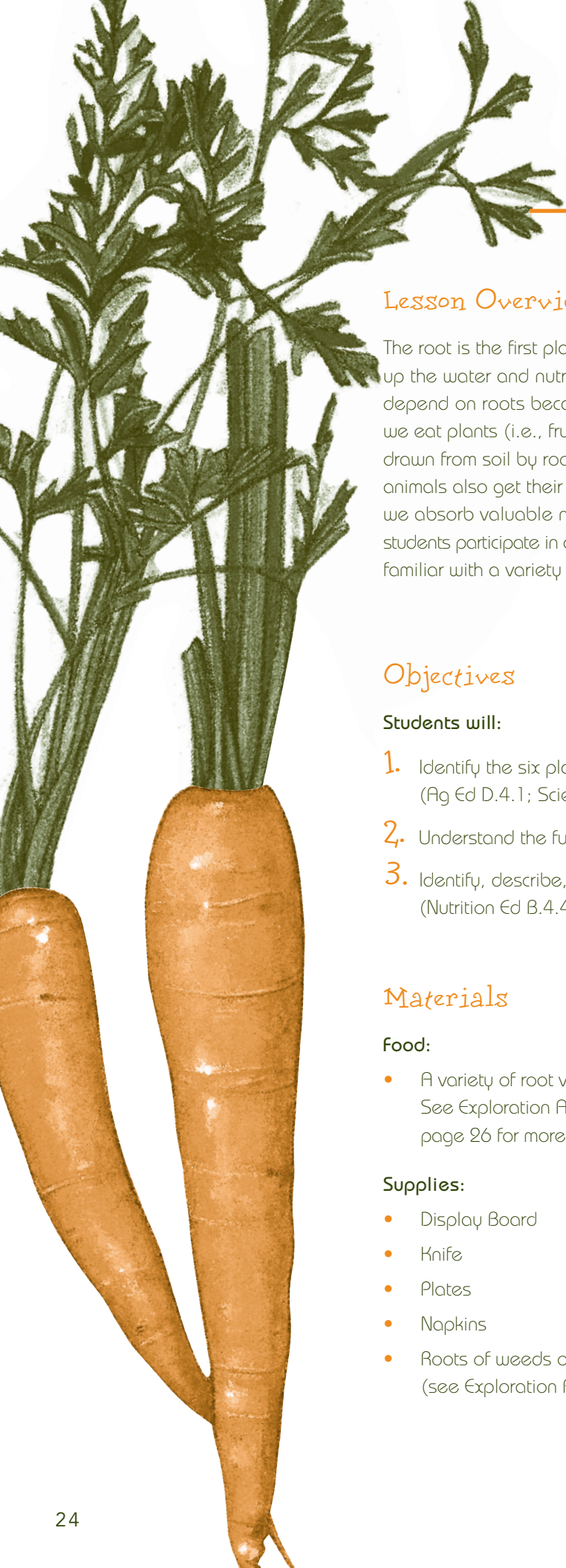
planting

We invite students to choose and plant from our seedling supply. Seedlings include basil, peppers, tomatoes, kale, cabbage, kohlrabi, onion, broccoli, fennel, flowers, parsley, and lavender. With a trowel in hand, kids plant their seedlings in garden beds. Many times kids help ready the garden beds for planting by pulling weeds, raking the soil, and adding compost by wheel barrow.

We teach students to gently pull the seedling from its tray and spread, or pull apart, the compacted roots. Often, kids will teach one another this process as new planters join the station. Digging a hole large enough to accommodate the plant's roots, and spaced far enough away from neighboring plants, kids give the seedlings new homes. They gently fill in the hole, adding a bit of compost and a loving wish for good growth.

We are not done yet! The next step is to mulch the area around the seedling with hay, creating a small nest. The hay provides cool shade for the soil, keeps soil moist longer, and prevents weed growth.

— Hannah Lavold,
Garden Educator,
Community GroundWorks
at Troy Gardens



Roots

Lesson Overview

The root is the first plant part to emerge from the seed in order to draw up the water and nutrients that the plant needs to grow. People also depend on roots because our bodies absorb important nutrients when we eat plants (i.e., fruits and vegetables). The nutrients we consume are drawn from soil by roots and then transported throughout the plant. Other animals also get their nutrients from plants (e.g., a cow eating grass), so we absorb valuable nutrients when we eat meat as well. In this lesson, students participate in a discussion about the function of roots and become familiar with a variety of roots we eat through an exploration activity.

Objectives

Students will:

1. Identify the six plant parts and describe the life cycle of plants (Ag Ed D.4.1; Science F.4.3)
2. Understand the function of various types of roots (Science F.4.1, F.4.2)
3. Identify, describe, and taste different plant foods (Nutrition Ed B.4.4, C.4.2, D.4.1, E.4.1, F.4.1, F.4.2, F.4.3)

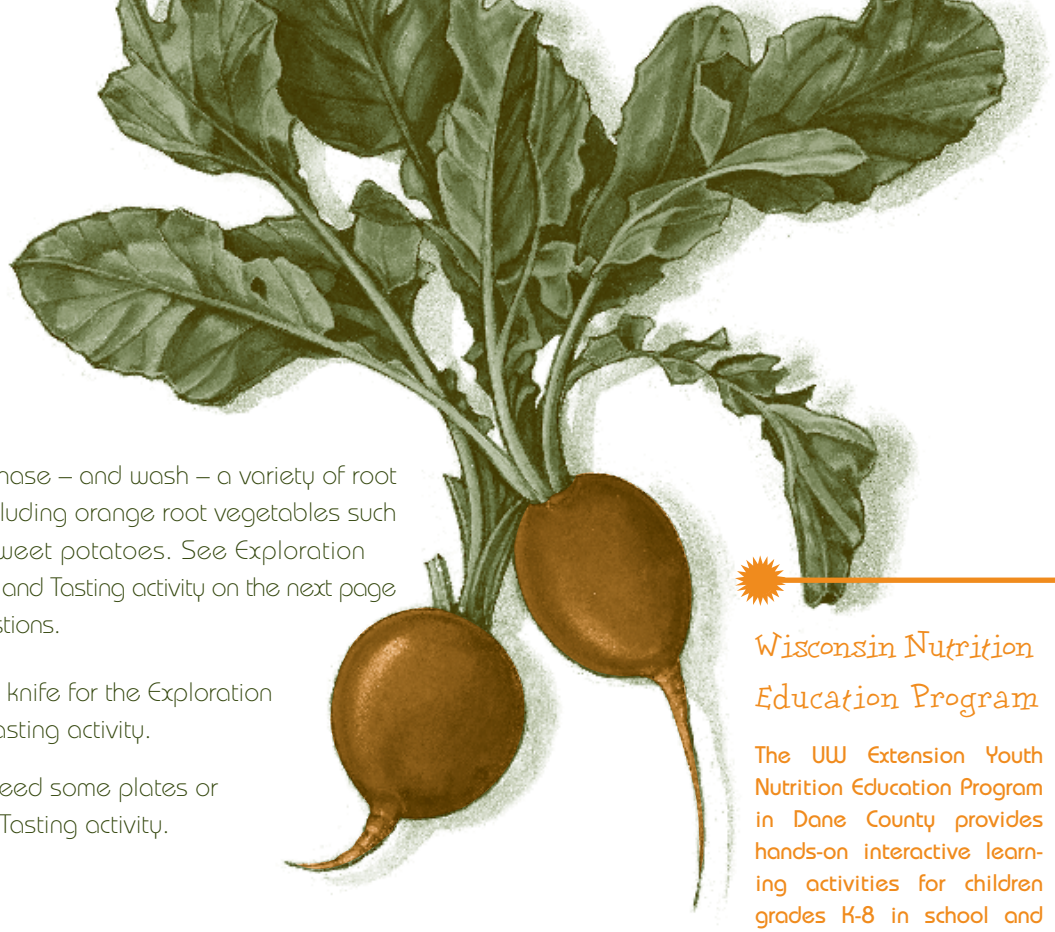
Materials

Food:

- A variety of root vegetables (e.g., carrots, sweet potatoes, radishes. See Exploration Activities on the next page and Tasting activity on page 26 for more suggestions)

Supplies:

- Display Board
- Knife
- Plates
- Napkins
- Roots of weeds or other plants (see Exploration Activities)



Preparation

1. Harvest or purchase – and wash – a variety of root vegetables, including orange root vegetables such as carrots or sweet potatoes. See Exploration Activities below and Tasting activity on the next page for more suggestions.
2. You will need a knife for the Exploration Activities and Tasting activity.
3. You may also need some plates or napkins for the Tasting activity.

Procedure

Introduction: On a display board in the garden or classroom, list the six main plant parts we eat: seeds, roots, stems, leaves, flowers, and fruit. Begin a discussion by asking students which of those parts is the first to grow out of a seed when it is planted. Or ask students what plant part they eat when they eat a carrot. *Answer:* The root. Have students list as many root vegetables as they can. Have them identify all the root vegetables you have growing in your garden, or make a list of those they'd like to grow.

Based on the list, students know that roots can be a delicious and healthy food for us, but what do the roots do for the plant? *Answer:* Absorb nutrients and water from the soil and provide support by anchoring the plant in the ground. Ask students how people get the water and nutrients they need since they don't have roots. *Answer:* The nutrients that the roots absorb end up in the food we eat. Roots do a big job in making sure both plants and people have the nutrients needed to live and grow. The large roots that we eat such as sweet potatoes and celeriac also store food for the plant.

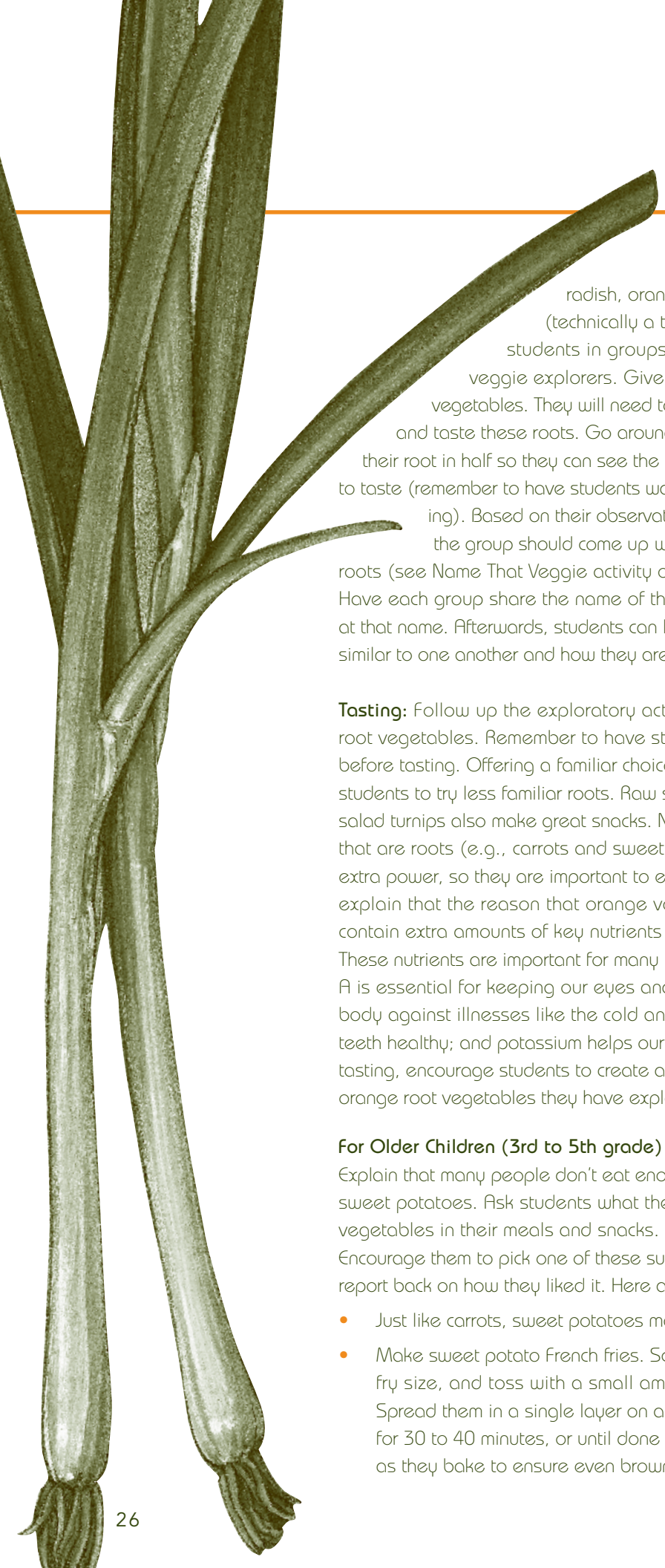
Exploration Activities: Harvest some weeds or other plants that are ready to be pulled up and examine the roots. The primary root is the largest and usually central root. Sometimes this is a taproot—a large tapered root like a carrot. Other plants, such as lettuce, have fibrous root systems. The secondary roots are the smaller roots that grow horizontally off the primary root. A taproot stores food for the plant and the secondary roots both anchor the plant and absorb water and nutrients.

Collect – and wash – a variety of interesting root vegetables from the garden, farmers' market, or grocery store, such as golden or cylindra beets, turnips, ginger, celeriac, rutabaga, beauty-heart (watermelon) radish, black Spanish

Wisconsin Nutrition Education Program

The UW Extension Youth Nutrition Education Program in Dane County provides hands-on interactive learning activities for children grades K-8 in school and afterschool programs. Educators also focus on the importance of food safety, especially the benefits of hand washing. The afterschool programs include fun with food clubs and gardening clubs, where the children explore healthy ways to prepare snacks and foods, and grow, harvest and enjoy eating tasty fruits and vegetables. The Wisconsin Nutrition Education Program provides nutrition education to adults and families in 68 counties across Wisconsin. Contact your local Extension office for more information.

— Tracy Smith,
Wisconsin Nutrition Education Program Administrator,
Dane County University of Wisconsin-Extension



radish, orange and purple carrots, blue potatoes (technically a tuber), and sweet potatoes. Organize students in groups of four and tell them they are root veggie explorers. Give each group one or two of the root vegetables. They will need to use their senses to look at, feel, smell, and taste these roots. Go around to each group and cut one sample of their root in half so they can see the inside. If possible, offer them a sample to taste (remember to have students wash or sanitize their hands before tasting). Based on their observations about various root characteristics, the group should come up with a new and unique name for these roots (see Name That Veggie activity on page 44 in the À La Carte Section). Have each group share the name of their root and explain how they arrived at that name. Afterwards, students can look for ways that all of the roots are similar to one another and how they are different.

Tasting: Follow up the exploratory activity with a tasting of a variety of root vegetables. Remember to have students wash or sanitize their hands before tasting. Offering a familiar choice, such as a carrot, makes it easier for students to try less familiar roots. Raw sweet potato, radishes, celeriac, and salad turnips also make great snacks. Note: The "super orange" vegetables that are roots (e.g., carrots and sweet potatoes) provide our bodies with extra power, so they are important to eat often. For older students, you could explain that the reason that orange vegetable are "super" is because they contain extra amounts of key nutrients like vitamins A and C and potassium. These nutrients are important for many reasons, including the following: Vitamin A is essential for keeping our eyes and skin healthy and for protecting our body against illnesses like the cold and flu; Vitamin C keeps our gums and teeth healthy; and potassium helps our hearts stay healthy. During or after the tasting, encourage students to create a superhero type name for each of the orange root vegetables they have explored.

For Older Children (3rd to 5th grade)

Explain that many people don't eat enough orange vegetables like carrots and sweet potatoes. Ask students what they could do to eat more "super orange" vegetables in their meals and snacks. Write their suggestions on the board. Encourage them to pick one of these suggestions and try it at home. Have them report back on how they liked it. Here are a couple suggestions for your list:

- Just like carrots, sweet potatoes make a great raw snack. Really!
- Make sweet potato French fries. Scrub or peel them, cut them into French fry size, and toss with a small amount of Olive or Canola oil and salt. Spread them in a single layer on a sheet pan and bake at 400 degrees for 30 to 40 minutes, or until done to your liking. Turn the fries a few times as they bake to ensure even browning.

- Add grated carrots to your pasta sauce or salads.
- Make a fun snack—broccoli and carrot trees. Take a carrot stick (tree's trunk) and add 1-2 broccoli florets (tree's leaves and branches) to one end of the stick. Add a dollop of yogurt-based veggie dip to the broccoli florets to make a snow-covered tree.

Take Home Activity

Develop or find a recipe based on one of the suggestions for eating more carrots and sweet potatoes. Perhaps a parent or caregiver could provide a favorite recipe. Send the recipe home with students to make with their family.

Additional Activities

Sprouting plants:

Sweet potato: Stick three toothpicks around the middle of the potato and support them on the rim of a clear glass or plastic cup with the plumper or rounded side of the potato facing up. Fill the glass with water so that the bottom of the potato is in water. Change the water weekly and replenish what evaporates. The roots will develop on the tapered bottom end of the potato while the stem and leaf buds develop at the top.

Carrot: Select fresh, large-sized carrots (not "baby" carrots) from the garden or market for this activity. Do not use those that are sold with the tops still on them. Remove the top two inches of the root (carrot) for the experiment and enjoy eating the rest. Put a one-inch layer of pebbles or pea gravel in a saucer. Place the carrots on top of the gravel, cut-side down, and add more pebbles to hold them in place, leaving about an inch or two of the carrot root exposed above the pebbles. Space the carrots about two inches apart in the saucer. Add water to the top of the pebbles and maintain that water level at all times. Feathery green leaves will grow out of the carrot tops.

it takes a community

Getting community members and organizations involved in youth gardening is an invaluable resource. UW-Extension Master Gardeners can offer technical support on how and when to plant your garden as well as maintenance and trouble-shooting; local non-profit organizations may assist with finding funding opportunities; Parent Teacher Organizations can provide ideas and volunteers; School district officials can ensure that you have the support and supplies needed to make the garden more sustainable. In turn, community members see that investing in the health and education of youth is a powerful way to ensure a healthy community into the future.

— Elizabeth Gering,
Youth Grow Local Coordinator,
Community GroundWorks
at Troy Gardens

Stems & Leaves

Lesson Overview

All of the six main plant parts that we eat perform an essential function in the life cycle of plants. Stems provide structural support while transporting water and nutrients throughout the plant. Photosynthesis—a process which we depend on to live—happens in the leaves of the plant. This lesson teaches students about the important work done by stems and leaves, and provides an opportunity to taste some of the many delicious stems and leaves we eat. It also encourages students to eat more highly nutritious dark green, leafy vegetables.

Objectives

Students will:

1. Describe the function of stems and leaves (Ag Ed D.4.1; Science C.4.2, F.4.1, F.4.4)
2. Identify what plants need to live and grow (Environmental Ed E.4.1; Science F.4.4)
3. Identify, taste, and describe a variety of vegetables that are stems and leaves (Nutrition Ed B.4.4, C.4.2, E.4.1, F.4.1, F.4.2, F.4.3)

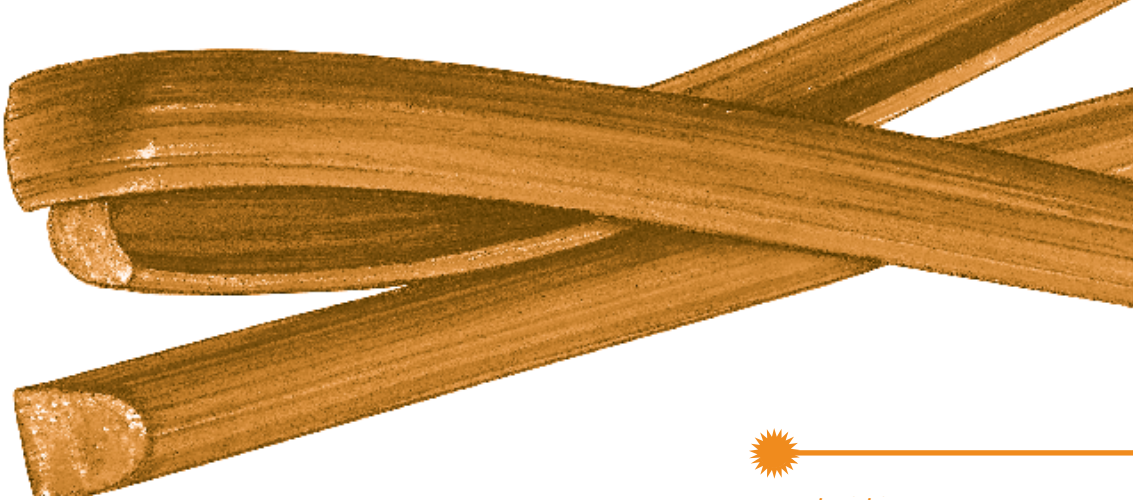
Materials

Food:

- Vegetables that are stems and leaves (e.g., celery and kohlrabi for stems and spinach and cilantro for leaves. See Tasting activity on page 30-31 for more suggestions).

Supplies:

- Plates
- Napkins
- Cups for water
- Vegetable peeler
- Crackers
- Word Bank and Tasting Chart (included in The Color Harvest lesson on page 13)
- Props for Chef Chlorophyll Theater—large pot, big mixing spoon, chef hat and photos or illustrations that represent the elements plants need for photosynthesis: sunlight, water, and air.
- Blue batons, cups of water, or something else that represents water. Green batons or something else that represents nutrient-rich food (see Great Stem Relay on page 30 for more information).



Preparation

1. Harvest or purchase – and wash – a variety of edible stems and leaves (e.g., celery and kohlrabi for stems and spinach and cilantro for leaves. See Tasting activity on page 30-31 for more suggestions).
2. Write the name of each edible stem and leaf on a display board or poster to record student descriptions. Post Word Bank with adjectives to guide students' sensory observations (refer to Tasting Chart and Word Bank in the Color Harvest lesson on page 13).
3. Print or create images representing sunlight, water, and air for Chef Chlorophyll Theater. You'll also need a soup pot and a large spoon. A chef hat is also a nice touch.
4. Create blue and green batons using paper towel rolls and paint or markers (see Great Stem Relay on the next page for more information).

Procedure

Chef Chlorophyll Theater

This short skit is intended to introduce students to photosynthesis. The primary objective is to teach students that plants make food for themselves, which helps make plants healthy for us to eat. Introduce this activity by reminding students that roots and stems pull nutrients and water up from the soil, but leaves also do something very special by making food through a process called photosynthesis. Have one teacher play "Chef Chlorophyll" and another adult help ask questions and hand out ingredients. You can also help students perform the roles of Chef Chlorophyll and the skit facilitator. For older students, you can explain that Chef Chlorophyll takes his name from the green pigment in plants that enables them to perform photosynthesis. Chlorophyll is also what makes plants green.

This short skit takes place inside a leaf, where Chef Chlorophyll sits with his pot and spoon, mixing up food for the plant. Chef Chlorophyll introduces himself and tells students that he is working inside his leaf kitchen to make a delicious dish for the plant. He takes a taste from his pot and says, "It tastes okay, but it needs a few ingredients." Chef Chlorophyll's helper asks students what ingredients the chef needs. The helper can explain that the missing ingredients are things that plants need to live and grow. *Answer:* sunlight, water, and air (carbon dioxide).

nutrition standards

What a student eats can have a significant impact on a student's ability to learn and to live a healthy life. Nutrition education can positively influence students' eating behaviors and assist them to develop healthy eating habits. The Wisconsin Model Academic Standards for Nutrition are a tool for educators to use to expand the nutrition curricula for their students. The nutrition standards support nutrition education so it will occur sequentially from preschool through secondary school, and provide children with the knowledge and skills needed to lead healthy lives.

Wisconsin Model Academic Standards for Nutrition
http://dpi.wi.gov/fscp/pdf/nestandards.pdf

— Jill Camber Davidson, Nutrition Education Consultant, Wisconsin Department of Public Instruction

When a student answers with one of the correct ingredients give them a picture of that ingredient and have them drop it in the chef's pot. Chef Chlorophyll stirs it in and tastes again. "Mmmm, that tastes better, but a couple more ingredients are needed!" Repeat until all three ingredients are in the pot. Conclude with Chef Chlorophyll stating that the mixture tastes delicious and that the food is ready.

Follow up with a brief discussion about photosynthesis. Ask students if people make food like plants do. Explain that only plants are truly able to make their own food. Ask them to imagine what it would be like if people could just make a sandwich or spaghetti inside their hand. That's a bit what it's like for plants. Explain that people (and other animals) depend on plants for food and that eating plants helps make us healthy! Plants also help make us healthy by creating oxygen for us to breathe through the process of photosynthesis.

The Great Stem Relay

This running game is designed to help students understand the important role stems play in transporting water and nutrients throughout plants. Now that students understand that Chef Chlorophyll needs sunlight, water, and air in order to make food, ask students to explain how Chef Chlorophyll gets these essential ingredients into his leaf kitchen. *Answer:* Plants absorb sunlight from the Sun, they use carbon dioxide from the air that surrounds them, and they pull water from the ground using their roots. What role do stems play in this process? *Answer:* They provide the transit corridors. Not only does water travel to the leaves in these corridors, but the newly manufactured food travels from the leaves to where it needs to go to feed the plant and keep it healthy. Create a stem relay race course with blue batons to indicate water (or to add a fun extra challenge, use buckets or cups full of water) and green batons to indicate nutrient-rich food from Chef Chlorophyll's kitchen. The starting point is at the roots where runners must carry the blue "water" batons through the stem corridor to the other side where they hand the batons to Chef Chlorophyll in his leaf kitchen. Once the hand-off has occurred, the green "food" baton runners who have been waiting in the kitchen can speed off to deliver the newly manufactured food to the roots at the starting point.

Tasting: Have students taste and compare a variety of stems and leaves. Kohlrabi is a very tasty stem. Although it may not look like one, it is actually an enlarged stem used for storing water and nutrients for the plant. Other tasty stems include celery (technically a leaf stalk), asparagus, and broccoli stems. There are many choices of edible leaves—any herbs or leafy greens will do for

this tasting. Choose some of your favorites and some new ones (e.g., spinach, arugula, cilantro, basil, parsley, chard, bok choy, and beet greens). Plan ahead by planting a variety of edible stems and leaves in your garden. Encourage students to use their senses and describe each leaf or stem as they taste it. Remember to have students wash or sanitize their hands before tasting. Similar to the Tasting activity in The Color Harvest lesson on page 12, use a display board or Tasting Chart to write down student observations. Post a Word Bank with adjectives to guide students' sensory observations. Students will likely generate fun new describing words, which you can add to your Word Bank for future sensory observation activities. Provide water for the students to drink or crackers as palate cleansers since some of the leaves have strong or bitter flavors.

Additional Activities

Super Green Veggies: People use the nutrients we get from food to grow and stay healthy. Nutrients help us build muscles, bone, skin, teeth, and all the other parts of our bodies. Have students identify "super green" leafy vegetables that are growing in their garden (e.g., kale, collard greens, romaine lettuce, spinach, watercress, and mustard greens). Have students also identify "super green" stem vegetables (e.g., broccoli and spinach). Note: For older students, you could explain that fruits and vegetables contain many nutrients including vitamin A and C, potassium, and dietary fiber. There are also some special fruits and vegetables, called the "Super Green". These dark green vegetables are important to eat often because they contain extra amounts of key nutrients like vitamins A and C and potassium. These nutrients are important for many reasons, including the following: Vitamin A is essential for keeping our eyes and skin healthy and for protecting our body against illnesses like the cold and flu; Vitamin C keeps our gums and teeth healthy; and potassium helps our hearts stay healthy.

Chlorophyll Rub: After the Tasting activity, do a leaf pressing using watercolor paper. Fold a piece of paper in half. Place leaves to be pressed between the halves and rub over the top with the back of a large spoon. The chlorophyll in the leaves will print to the paper. Have students write the name of each leaf and some words describing the flavor next to each print. Cut the paper in bookmark size, or have each student do a different leaf and glue them to a poster.

garden fit

The garden provides young people with an excellent place to engage in meaningful fitness. That is to say, it provides them a place to be active outdoors — shoveling compost, wrangling chickens, preparing garden beds, carting hay around in wheelbarrows — all in the pursuit of healthful food production. Youth gain fitness as well as sense of purpose and accomplishment as they grow food for themselves, their families, and their communities.

— Nathan Larson,
Education Director,
Community GroundWorks
at Troy Gardens

voices from the Kids' garden

"When I shovel real good I get really strong muscles."

"Did you see me? I was walking the wheelbarrow back and forth and now my muscles are sore!"

Flowers & Fruit

Lesson Overview

In this lesson students learn that flowers produce the fruits we eat, and that some flowers themselves are edible. A short story is used to illustrate the process of flower, fruit, and seed growth. Follow the story with an activity in which students correctly arrange photos of flower and fruit growth. You may also have students document the growth and development of flowers and fruit in their garden journals with drawings or with photos.

Objectives

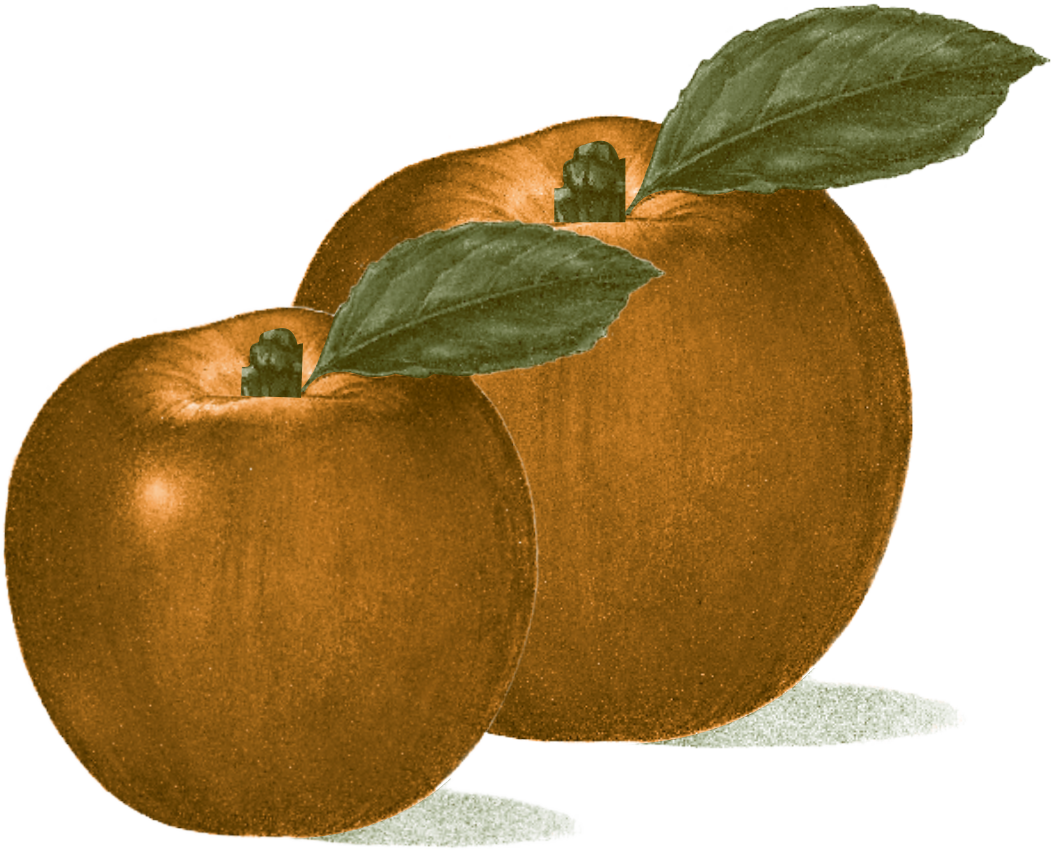
Students will:

1. Identify edible flowers and fruit as healthy food choices (Health A.4.3, B.4.1; Nutrition Ed C.4.2, F.4.1)
2. Explain how plants grow and develop (Science C.4.2, F.4.3)
3. Describe the function of flowers (Science C.4.2, F.4.3)
4. Identify and taste fruits and vegetables that come from flowering plants (Nutrition Ed F.4.2)

Materials

Food:

- Variety of edible flowers and fruits (e.g., broccoli, cauliflower, cucumbers, apples, nasturtiums. See Tasting activity for more suggestions)
- Vegetable and fruit dip (e.g., yogurt or low-fat sour cream and dill, ranch dressing)



Supplies:

- Books: *How Do Apples Grow?* by Betsy Maestro, *The Reason for a Flower* by Ruth Heller, or other books that illustrate how fruit grows from flowers
- Photos or drawings that represent the stages of flower and fruit development (Michigan State University Extension has a series of photos depicting the stages of apple growth: http://web1.msue.msu.edu/fruit/applgrw.htm)
- Plates
- Napkins
- Cutting Boards
- Knives

Preparation

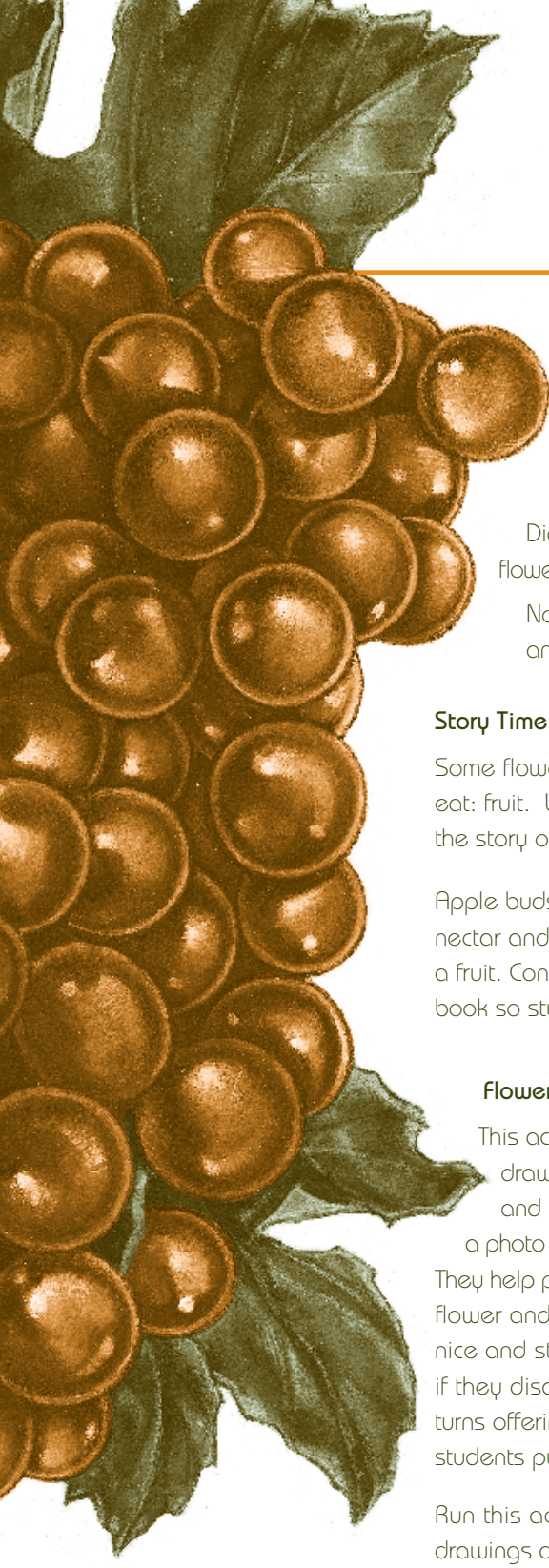
1. Collect photos or drawings that represent different stages in the development of flowers and fruit for Flower to Fruit Theater activity.
2. Harvest or purchase – and wash – a variety of edible flowers and fruits (e.g. broccoli, cauliflower, cucumbers, apples, nasturtiums. See Tasting activity for more suggestions). Plan ahead by planting some edible flowers and fruits in your garden.
3. Get *How Do Apples Grow?* by Betsy Maestro, *The Reason for a Flower* by Ruth Heller, or another book that illustrates how fruit grows from flowers.

voices from the Kids' Garden

"I wish I could grow a big giant strawberry so that we could ALL eat it!"

"So this is where the supermarket gets all its food?"

During a harvesting and snacking activity at a mulberry tree in the Kids' Garden, a child exclaimed, "I can't believe nature can taste so good! That's why I like to learn about nature."



Procedure

Introduction:

Start the lesson with a discussion. What do you think of when I mention flowers? Flowers are definitely beautiful and smell nice. Did you know some flowers are also nutritious? Can you think of some flowers that we eat? *Answer:* Broccoli, Cauliflower, Violets, Squash Blossoms.

Note: You may want to remind students that not all flowers are edible, and they shouldn't eat flowers unless a trusted adult says it's okay.

Story Time:

Some flowers are good for us to eat, but they also produce something else we eat: fruit. Use the book, *How Do Apples Grow?* by Betsy Maestro, to structure the story of a plant producing a flower and a fruit.

Apple buds survive the winter and blossom in the spring. Then a bee comes for nectar and carries pollen from another flower. The pollinated flower produces a fruit. Consider using leading questions before turning to the next page of the book so students can participate in telling this story.

Flower to Fruit Theater:

This activity can be run in the garden or classroom. You will need photos or drawings that represent different stages in the development of flowers and fruit. Student volunteers then come to the front of the class and hold a photo or drawing. These are the actors. The rest of the students are directors. They help put the actors in the correct order to represent the development of the flower and growth of the fruit. Ask the actors to hold their photo or drawing nice and still so it can be easily seen. They also need to take direction even if they disagree with where they are being placed. The directors should take turns offering suggestions. Use clues and leading questions, if needed, to help students put the photos in the right order.

Run this activity with a fruit and a vegetable. First, use a set of photos or drawings depicting apple development (e.g., an apple blossom, a bee on the blossom, fruit starting to form, a small apple, and a mature apple). Second, use photos or drawings of a developing squash (e.g., a small flower, a fully developed squash blossom, a small squash, and a fully-grown squash). If you run this activity in the garden, you can provide students with time afterwards to explore the garden looking for flowers and fruits in different stages of development. Have students document what they find by taking photos or drawing pictures and use these for the next time you run this activity.

Tasting:

Offer a garden medley of edible flowers and fruits—including broccoli, cauliflower, cucumbers, apples, and nasturtiums. Serve the medley with a yogurt-based dip for a tasty garden snack. Johnny Jump-ups, nasturtiums, broccoli, cauliflower, asparagus tips, squash blossoms, and violets are all edible flowers that can be grown in your garden or found at your local farmers' market. Consider holding a flower tasting in the garden! Many fruits can be grown in the garden including blueberries, raspberries, grapes, cherries, pears, apples, cantaloupes, and watermelons. You can also grow many delicious and nutritious vegetables (also considered "botanical fruits" because they contain seeds) such as zucchini, cucumber, winter and summer squashes, eggplant, peppers, tomatoes, okra, green beans, and pea pods. Note: Winter squashes like butternut squash and pumpkins are "super orange" vegetables that are packed full of extra nutrients and make up a regular part of a healthy diet. For older students, you could explain that the "super orange" vegetables are particularly important to eat often because they contain extra amounts of key nutrients like vitamins A and C and potassium. These nutrients are important for many reasons, including the following: Vitamin A is essential for keeping our eyes and skin healthy and for protecting our body against illnesses like the cold and flu; Vitamin C keeps our gums and teeth healthy; and potassium helps our hearts stay healthy.

Additional Activities

- **In the garden**, have students document, over time, the growth and development of flowers and fruit using garden journals or by taking photos. Strawberry plants and squash plants work well because it is easy to see the developing flowers and fruit. Plan ahead to grow squash and strawberries in the garden.
- **How many flowers and fruits can be found in the garden?** Encourage students to find them and make a map. Or make a collage of photos or drawings. Also see Nettle Rope & Flower Braiding activity on page 42 in the À La Carte section.
- **Flower Anatomy in the Garden:** Provide students with a simple diagram depicting different flower parts. Dissect squash or other garden flowers to examine parts in greater detail.

vegetable or fruit?

Vegetable and fruit are culinary terms describing different types of food from plants. Essentially, fruits are the sweeter of the two. Fruit, however, also happens to be a botanical term for one of the six plant parts. Botanically speaking, the fruit is the part of the plant that carries the seeds. A vegetable can be any part of a plant. There are, for example, root vegetables and leaf vegetables, etc. And so, there can in fact be fruit vegetables, which are culinary vegetables that are made of the fruiting body of the plant. Examples include tomatoes, cucumbers, and eggplants.

— Whitney Cohen,
Education Director,
Life Lab Science Program

Photo by Dorra

"I like gardening because you can try things, taste them, eat them and watch them grow."

— Dorra, age 9

À La Carte

Additional Garden-Based Activities

Keeping a Garden Journal

Keeping a garden journal is a great way for students to reflect on their experiences in the garden. Students will use their observation and creative writing skills to create a daily account of changes in the garden throughout the growing season.

Supplies: Students can purchase a journal or notebook to record their observations, or they can create a journal using loose paper and twine. To construct a journal you will need loose leaf paper, printer paper, or colorful construction paper as well as a hole-punch, twine, pen/pencil, and scissors.

Directions: Gather together the desired number of loose sheets of paper. If the paper does not already have holes, use the hole-punch to create 2-3 holes on one edge. Cut 2-3 small pieces of twine and use them to bind the paper together through each of the holes. Have students decorate the front cover of their garden journal however they choose. Students can separate their garden journal into sections either by date or by topic such as weather (Science), phenology (Science), how much produce they have harvested (Math), and notes about how the garden is growing (English/Language Arts). Students will need a pen or a pencil for recording their observations.

Weather

Have students record the weather on a daily basis so that they gain an understanding of how it affects the growth and health of plants in your garden. Weather station tools such as a rain gauge, thermometer, and wind vane provide a fun way for students to observe and measure weather-related changes in the garden.

Phenology

Have students observe and record the life cycle of both plants and animals in the garden and how they relate to the changing seasons. For example, record the day you first see a robin, seed sprout, squash blossom, ripe tomato, and frost damage on garden plants. Then have students compare these events with weather patterns to gain a better understanding of the changing seasons.

Garden Notes

Have students record general observations from the garden in a variety of creative formats. They may write poems about the spicy flavor of a radish, short fiction stories about animals in the garden, or simply how they feel in that moment sitting in the garden. Students will form a stronger connection with the garden by looking deeper into the many changes and experiences they have while they are there.

Digging and Wheel Barrowing in the Garden

Sometimes the most fun way to engage children in the garden is with simple tasks like digging and wheel barrowing. These common work activities become a form of play in the children's garden. After a day of sitting at desks, many students savor the chance to lose themselves in a digging project.

Supplies: Digging tools such as shovels or trowels, wheel barrows.

Directions: You can designate an area of your garden as the Digging Garden. Since most gardens always have new beds to be prepped for planting, the digging area can move around the garden so that students feel that they are improving their garden while having fun. Other fun activities that involve digging and wheel barrowing are moving compost from a pile outside the garden to add to garden beds or bringing woodchips to define garden paths. Kids enjoy the challenge of maneuvering a wheelbarrow loaded with compost through the twists and turns of the garden.

Chickens

Chickens are a great addition to any youth garden (providing you can gain municipal/site approval for keeping chickens and you have the capacity to care for them throughout the year). Students love feeding, holding, and generally interacting with chickens in the garden.

Supplies: Chicken coop, fencing for a chicken run, chickens, food, water, oyster shells, grit, wood shavings or other bedding material. See www.madcitychickens.com and www.backyardchickens.com/ for more information about keeping chickens.

Directions: Build, purchase, or find a local volunteer to construct your chicken coop (many great designs can be found at the websites listed above). Get chickens and let the fun begin! Students will enjoy learning to hold and feed the chickens, as well as how they contribute to a healthful food system. You can use aged chicken manure to add nutrients to your garden compost. Hens will typically lay one egg per day during the growing season, so consider holding an egg lottery where one or more lucky students win an egg to take home.

All photos in the A La Carte and Cooking & Eating in the Garden sections were taken at Troy Gardens.

Theme Gardens

Organizing some of your garden beds around a particular theme is a fun way to get students excited about the garden. Garden themes can also emphasize lessons in a variety of academic subjects including geography, social studies, history, and literature. Some examples of common themes used in gardens include popular foods and cultural heritage. Gardens can also be modeled after a popular book — such as *Tops and Bottoms* by Janet Stevens—that can help make the story come alive for students.

Pizza Garden

The ingredients of popular foods can be grown in your garden. A classic example of this is the pizza garden!

Supplies: Plants that are found on a pizza (e.g., tomatoes, peppers, oregano, onions, and basil). Materials for building raised bed frames shaped like pizza slices (e.g., rocks, lumber, or logs).

Directions: Design your pizza garden by building raised frames shaped like pizza slices out of lumber, logs, or rocks. Place your raised bed slices in a circle so they form the shape of a pizza pie (with walking paths in between). If you have limited space, you can plant one pizza slice. Help students plant a variety of pizza toppings such as tomatoes, oregano, onions, basil, or peppers in the pizza slice beds.

Try out a variety of other popular food theme gardens such as:

- Salsa Garden: Grow tomatoes, tomatillos, peppers (sweet and hot), onions, garlic, and cilantro.
- Pickle Garden: Grow cucumbers and dill.
- Cereal Bowl Garden: Grow different grains that are used to make cereal such as oats, rye, and corn.

Three Sisters Garden

The United States has a rich cultural history and the garden is an excellent place to showcase different gardening practices as well as fruits and vegetables that have originated from many corners of the Earth. One example is the Three Sisters Garden, which celebrates the gardening heritage of Native Americans. The Three Sisters are represented by beans, corns, and squash.

Supplies: A plot set aside in your garden, squash seeds, corn seeds, and bean seeds.
Note: There are many different varieties of all of these three crops that can be grown in your garden.

Directions: Plant the Three Sisters seeds in the designated garden plot. Plant the corn first. Once the corn has sprouted, plant the beans next to the corn—the corn stalks act as a trellis while the beans fix nitrogen into the soil to help feed the corn and the squash. Plant the squash in hills around the corn and beans—the thorny vines and broad leaves of the squash will help protect its sisters from predators and provide shade to deter weeds and keep the soil moist. Consult the National Gardening Associations' website (www.kidsgardening.com/growingideas/projects/march02/mar02-pg1.htm) and *In The Three Sisters Garden* by JoAnne Dennee for more about incorporating a Three Sisters theme in your garden.

There are a variety of other cultural gardens that can be incorporated into your garden. Consider consulting the experts in your community for advice about different gardening traditions. For example, if there are Hmong or Latino gardeners in your community, consult with them about specific plants and growing techniques that celebrate their respective growing traditions.

Color Scavenger Hunt

Create a scavenger hunt that involves searching for a variety of different colors of fruits and vegetables in the garden. This is a good opportunity to introduce students to some foods with which they may be less familiar.

Supplies: Creative descriptions for a variety of fruits and vegetables, colored paper, pens/pencils, and your garden.

Directions: Create color clue cards with descriptions for different fruits and vegetables from your garden. Each description should not include the name of the fruit or vegetable, but gives students hints about what it might be. For example, a description for a tomato might be, "A red, round vegetable that helps make pizza sauce and salsa colorful and delicious." To create a card, paste or tape the description on colored paper to help remind the students what color fruit or vegetable they are looking for. Ideas for a scavenger hunt could include the following:

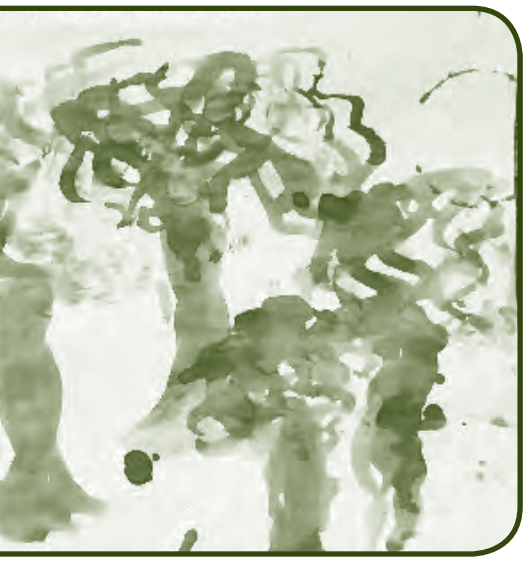
- Red – strawberry, pepper, raspberry
- Orange – nasturtium flower, cherry tomato, pie pumpkin
- Yellow – summer squash (e.g., pattypan, yellow crookneck), watermelon
- Green – collard greens, asparagus, broccoli
- Purple – eggplant, mulberry
- White – cauliflower, onion, garlic

Separate students into small groups and give each group their first color clue card. Once a group has found a fruit or vegetable in the garden to match their card, they will turn it in to the teacher to obtain a new color clue card. Repeat this process until each group has found all the matches to their color clue cards. You could also do this activity with the purpose of making a snack. For example, create cards that have descriptions of all of the vegetables needed to make salsa (e.g., tomatoes, tomatillos, peppers (sweet and hot), onions, garlic, and cilantro). Have students harvest as they find the vegetables and make the snack in the garden.

Garden Art

The garden is a great place for students to engage in artistic expression using natural materials.

Supplies: An area inside or outside of the garden. A range of plant and other materials from the garden (e.g., leaves, rocks, sticks, flowers). Ripe berries, paper, cups, brush (optional) for paintings.



Directions: In preparation for this activity, lay out borders using branches, long sticks, and/or rocks to create large frames on the ground. Explain that we're opening an earth art gallery and students can work in small groups or alone to create masterpieces. You could also do a big group piece with all students working together. Show students several photos of earth art to provide them with some inspiration and direction. For some truly remarkable examples, see *Andy Goldsworthy: A Collaboration with Nature* by Andy Goldsworthy. In addition, take photos of students' finished earth art to use as inspirational examples in the future. Give students a certain amount of time and space to create their design. At the end, do a gallery tour and have each group show off their creation. Another great garden art activity is berry painting—simply mash ripe berries (e.g., mulberries, raspberries, strawberries) in cups and use the mixture for finger or brush painting!

Nettle Rope & Flower Braiding

Stinging nettle is often considered an unwelcome weed in the garden, however, the stem can be used to make a very strong rope that is perfect for braiding! In addition, the leaves are delicious and nutritious (just make sure you deactivate the tiny stinging needles by steaming or drying them first).

Supplies: Stinging nettle plants from the garden, leather gloves, knife, scissors, and flowers.

Directions: To prepare for this activity, you will want to harvest some stinging nettle. Make sure that you are wearing long sleeves and leather gloves, and then pull the nettle plant out of the ground. Harvest all of the leaves with the scissors or a knife (the underside of the leaves have the long hairs that sting), so all that you are left with is the stalk. Hold a knife perpendicular to the stem and scrape off all of the hairy spines. Now that the stinging needles have been removed, the nettle plant is safe for students to handle. Have students pull long strips off of the outer layer of the stalk for braiding. Next, harvest a variety of flowers from your garden (Queen Anne's lace, clover, or other flowers with long, thin stems work well). Then students can weave flowers into the nettle rope braid, and tie the ends to make a bracelet, anklet, or necklace.

Hawks & Rabbits

This is a fun running activity designed to help students understand predator-prey relationships and food chains that exist in nature. You can make it relevant to the garden classroom by explaining to students that garden plants provide an important food source for rabbits and that hawks help garden plants grow by controlling rabbit populations around the garden. As a follow-up activity, you may choose to install raptor poles or bat houses in or near your garden to encourage regular visits from beneficial predators—just make sure to protect your chickens!

Supplies: Cones or lines on a field adjacent to the garden.

Directions: Use cones or lines to create safe zones on either side of an open field as well as side boundaries to limit the size of the running area. Explain to students that prey often need to travel through dangerous open areas where they are at risk of being hunted by predators in order to get to safer places—like a hidden feeding area or a rabbit warren. Explain that behind one line of cones is a safe rabbit warren and that behind the other line of cones is a safe feeding area but in between the two lines is an open field. Ask students to pretend they're hungry rabbits. In order to get to their safe feeding area from their warren, they will need to run through the field where the hawk is circling. Pick one student to be the hawk—he or she stands in the middle of the field. The rest of the students are rabbits and they all line up on the line that designates the safe rabbit warren. When the hawk sounds, the rabbits run across the field to their feeding area. The hawk tries to tag the rabbits. If they get tagged, they become a hawk for the next round. So it gets harder each time for the rabbits. When the hawk sounds again, the rabbits will need to run back from the feeding area to the safety of their warren. The hawk tries to tag the rabbits again. The rabbits will run back and forth between the feeding area and warren until the last rabbit is tagged. The last rabbit to get tagged becomes the new hawk to start the next game.

Garden Camera

This activity was adapted from *Sharing Nature with Children Vol. 2* by Joseph Cornell. It is a wonderful way for students to hone their observation skills and provides a structure for them to view the garden with fresh eyes. It also utilizes suspense and cultivates an appreciation of the beauty of the world around us!

Supplies: Cameras, display board or photo book.

Directions: Pair students up. One student is the photographer; one is the camera. The camera closes their eyes and keeps them closed until the photographer pulls their left earlobe. The photographer picks a scene they want to capture. This could be a close-up of a flower, a vegetable or some other garden scene. The photographer gently maneuvers the camera's frame of vision to capture that image. When the camera is in place, the photographer

gently pulls the left earlobe of the camera and the shutter snaps open (i.e., the person opens their eyes to view the garden scene). Next, the camera and photographer discuss the scene. Then they switch! Afterwards, provide each pair with a real camera to capture some of their favorite scenes in the garden. Create a photo display board or book with their photos so they can see the garden from each other's vantage points.

Name That Veggie

Instead of giving a name to vegetables every time a student asks, let them come up with a name on their own. By giving students the opportunity to discover their own vegetable, they develop a deeper appreciation for the plant, making it more likely that they will want to care for and eat that plant.

Supplies:

Variety of fruits and vegetables from the garden, a chalkboard or large piece of paper to make a list.

Directions:

Allow students to look at, feel, smell and taste the vegetables and then encourage them to come up with 3-4 words that they would use to describe it. From those words, have them come up with a new name (e.g., green spiracrunchtasticus).

Making Your Own Composting Worm Bin

Worm bins are a fantastic way for students to observe the nutrient cycle in action. Watch worms transform vegetable scraps into nutrient-rich compost that can be fed to growing plants in the garden. Worm bins come in all shapes and sizes—you can create a permanent bin outside in your garden or a smaller, portable bin in your classroom.

Supplies:

- ½ - 1 pound of red worms, available at a bait shop or online
- Two, 10-gallon opaque plastic bins with lids
- Mesh window screen
- Duct Tape
- Drill with ⅛ inch and ¼ inch settings
- Newspaper
- Dry Leaves
- Sprinkle of dirt
- Cardboard
- Food scraps

Instructions:

1. Drill 1/8 inch holes around the top 2 inches of Bin 1.
2. Drill about 30 ¼ inch holes in the bottom of the bin.
3. Drill about 8 2-inch holes, or 20 ½ inch holes around the bottom 2 inches of the sides of Bin 2 to give the worms air.
4. Measure and cut the screen to fit into bottom of Bin 1; install with duct tape to cover sharp edges.
5. Tear newspaper into ½ inch strips.
6. Soak newspaper strips in water; wring out excess water.
7. Layer about 4 inches of fluffed, wet newspaper mixed with dry leaves into Bin 1. This is the worms' bedding.
8. Sprinkle in a small handful of dirt as grit for the worms to grind food in their gizzard.
9. Add ½ to 1 pound of red worms. There are about 1000 worms in a pound, and they will reproduce fairly quickly.
10. Measure and cut cardboard to fit on top of newspaper bedding.
11. Soak cardboard in water, lay on top. Keep cardboard wet as it dries out over the weeks.
12. Stack Bin 1 into Bin 2, and Bin 2 will catch the drips from Bin 1.
13. Start introducing food scraps very slowly, and eventually the worms will be able to handle half their weight in food scraps every day. Feed the worms a handful of food scraps every 4-5 days, and bury them under the newspaper to avoid smells. Keep the lid on the worm bin to keep moisture in the bin. Use spray bottle if bedding materials start to dry out, but wetter food scraps should keep the bin moist on their own.

Worm Care:

Things to Remember:

- Worms need moisture to breathe
- They are vegetarians
- Bury the food scraps in a new place every day

Problem	Cause	Solution
Worms are dying	• Too wet • Too dry • Not enough air	• Add more bedding • Moisten bedding • Drill more holes
Bin Stinks!	• Too much food • Too wet	• Do not feed for a couple weeks • Add more bedding
Fruit Flies	Exposed food	Bury food in bedding

"Coming up with recipes for cooking in the garden is really a matter of not cooking. Just putting the vegetables together in as much of a fresh form as you can and really just putting a little bit of flavor onto them, and letting them see all the colors naturally because obviously when you cook it, things change. But it's also about getting together, having a little harvest party, and every day we sit together and we eat something from the garden ... and that's what really gets you because everybody loves to eat."

— Tory Miller
Executive Chef & Co-Proprietor
L'Etoile Restaurant

Cooking & Eating in the Garden

Eating Fruits & Vegetables in the Garden

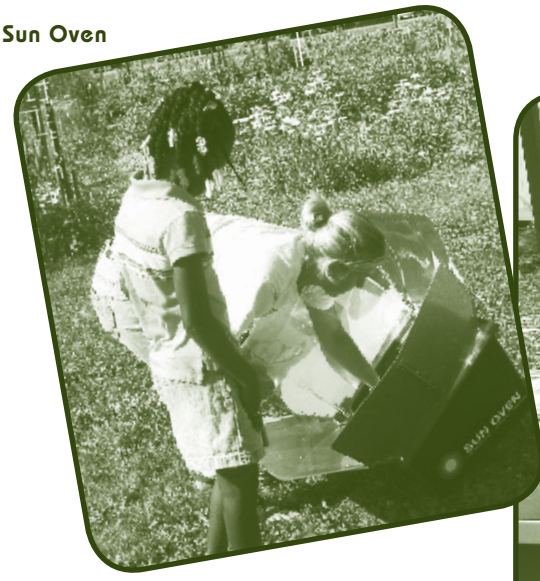
Growing, cooking and tasting activities are proven ways to get students to try new fruits and vegetables! When they take part in the entire process—from starting seeds to harvesting food to preparing meals—students enthusiastically incorporate more vegetables and fruit into their diets. Encourage everyone to try a small bite—it may take several times before a student develops a taste for a specific fruit, vegetable, or prepared dish in the garden.

Cooking in the Garden

Cooking is a favorite activity for students—many recipes can be prepared right in the garden, allowing young people to taste the fruits of their labor! This adds to the full experience of growing food. By cooking in the garden, students are not only introduced to the raw ingredients that make up some of their favorite foods, they can see first-hand how they are prepared in a healthy way. Even young children can be involved in preparing snacks and meals in the garden. Children as young as two can help with washing and scrubbing the fruits and vegetables harvested from the garden. They can also help by tearing lettuce leaves to prepare salad greens or snapping peas. Four and five-year olds can help mash soft fruits and vegetables, measure dry and liquid ingredients, and mix ingredients. Students older than five have many, many ways to get involved in cooking—they can chop, mix, mash and roll a wide variety of different ingredients. As students get older, they can further develop their culinary skills with a broader array of recipes and techniques. To make the cooking experience fun, safe and productive, it is important to have the right tools. Here are some suggestions:

- Stainless steel tables for preparing garden dishes.
- Colorful plates, bowls, and cutting boards are fun for students to use.
- Knives: Due to the sometimes chaotic nature of the outdoor kitchen, using stainless steel serrated dinner knives will eliminate the worry of students cutting themselves with sharper knives. They are usually heavy and sharp enough to cut most vegetables and fruits from the garden. If you are able to provide good training and supervision, students are also perfectly capable of using sharp knives. Make sure students are using the proper cutting techniques. Students should hold knife in one hand and object with a closed fist in the other hand.
- Stainless steel bowls of various sizes are great for mixing and collecting ingredients from the garden.
- Stainless steel or plastic strainers are great for washing garden produce.
- Big wooden or stainless steel spoons for mixing and mashing.
- Peeler for vegetables with tough outer skins like kohlrabi.
- Hand crank cheese grater for processing cheeses like parmesan for pesto.
- Scissors for cutting herbs like rosemary.

Sun Oven



Garden Kitchen

Earth Oven

Outdoor cooking appliances add a degree of fun to the garden kitchen while allowing you to make a wider variety of meals and snacks:

- **Solar oven:** A fun and educational way to bake garden treats using the power of the sun. These can be made either from inexpensive materials or purchased.
- **Earth oven:** A great place for baking garden pizzas and this can be constructed out of clay, sand, and straw by students right in the garden!
- **Hand-crank blender:** A must-have in the garden kitchen. Students will enjoy blending everything from basil pesto to tomatillo salsa!
- **Bike-powered grain mill/blender:** Another great way to add fun and fitness to the outdoor kitchen while teaching students about food. For example, students can learn first-hand how wheat berries are transformed into flour and then how flour is turned into pizza dough.

Farm Stand: Bringing the Food Home

Food that is not eaten fresh off the vine in the garden can be sent home with the students so that their families receive the benefits of fresh garden vegetables and fruits as well. During the harvest season, create a student-run farm stand where students and parents can select garden fresh food for use in meals and snacks at home. Students can harvest and prep garden produce to stock the stand during their daily time in the garden. Consider adding recipe cards or a parent newsletter that features daily offerings with recipes and information about storage and other tips for specific fruits and vegetables.

Safety Tips for Teachers

There are a few simple things to remember when cooking and preparing food in the garden, including the following:

- Raw fruits and vegetables may be a choking hazard for very young children. Cut fruits and vegetables into quarters or very small pieces or cook to soften before serving.
- Make sure students wash their hands or hand sanitize prior to any cooking and eating activities to ensure proper sanitation.
- Ensure students are properly supervised during food preparation and cooking activities.
- Rinse fresh fruits and vegetables before eating under clean running water. For more information on food safety for fruits and vegetables, visit www.fruitsandveggiesmatter.gov/health_professionals/food_safety.html.
- Practice good food safety—keep hot foods hot and cold foods cold. For more information and resources for talking about food safety with kids, visit www.fsis.usda.gov/Food_Safety_Education/For_Kids_&_Teens/index.asp.

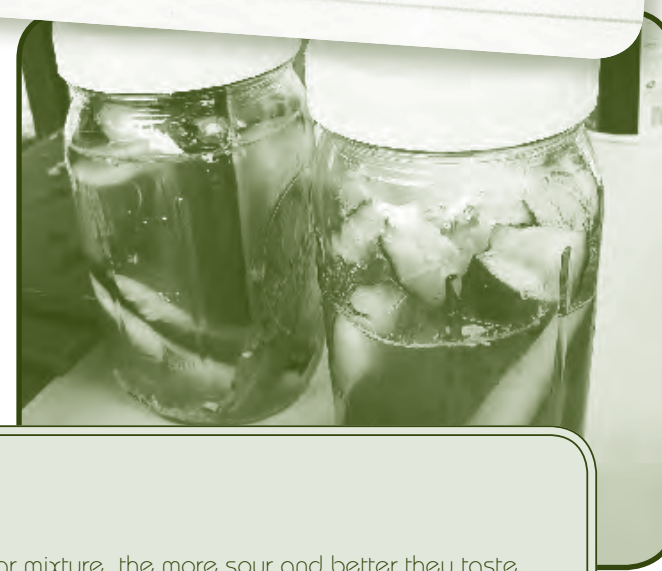
Favorite recipes from the Kids' Garden at Troy Gardens

Kids' Garden Refrigerator Pickles

Ingredients:

- 1/2 cup of vinegar
- 2 cups of water
- 8 teaspoons salt
- 1 cup dill (flowers, seeds, and stems all work)
- 5-6 medium cucumbers
- 4 pinches of mustard seed
- 6 black peppercorns

Harvest, wash, and slice the cucumbers into wedges. Place them in a bowl with the dill and salt, and mix them by hand or with a mixing spoon. Using two mason jars, add to each 2 pinches of mustard seed, 3 peppercorns, ¼ cup of vinegar, and one cup of water. Add half of the dill/salt/cucumber mixture to each jar. Seal the lid and mix the pickles until you can't wait any longer to eat them!



Kids' Garden Tips:

- The longer the pickles sit in the vinegar mixture, the more sour and better they taste.
- Don't be afraid to add more or less salt depending on your taste preferences.
- Our pickles are so popular they rarely reach the refrigerator. If you do have leftovers, check with your local food safety specialist to see how long they keep.
- Add more vegetables to the mix, such as onion, radishes and garlic for new exciting flavors.

Garden Spring Rolls

Ingredients:

Rice noodles

Rice Paper

Chef Tory's Dipping Sauce (see below)

Any veggies fresh from the garden – try onion, garlic, broccoli, radishes, kale, green or red tomatoes, basil, carrots or anything else that might be in season.

Olive oil

Salt

Harvest the vegetables from your garden and cut them into small pieces. In the meantime, break the rice paper sheets in half, and soak them in a shallow dish or plate of water until soft (about 2 minutes). When the vegetables are ready, lay out the rice paper on plates or cutting boards, fill them, roll them up, and they are ready to go!

Kids' Garden Tips:

- When we run out of Chef Tory's Dipping Sauce, we switch to balsamic vinegar and it tastes great.
- On days that we make pesto, we also put it in the spring rolls for extra flavor.
- Cooking the noodles early in the morning or the night before makes set up very easy. It is also easier when the noodles are cut up.
- Cutting the rolls in half makes for less waste.

Chef Tory's Dipping Sauce

Ingredients:

1 tablespoon soy sauce

1 tablespoon water

1 teaspoon rice wine vinegar

1 teaspoon sesame seed oil

Fresh grated ginger

Chopped scallions

Honey and hot sauce to taste

Peanuts or peanut butter (optional)

Mix all ingredients and taste for balance. Should taste deliciously sweet, spicy and tangy.

What's-That-Green-Stuff Can-We-Make-it-Again Pesto

Ingredients:

Large bowl of basil, about 3 cups (or use 1/2 basil and 1/2 Red Russian Kale)

2 or more cloves of garlic

1/4 cup parmesan cheese

1/4 cup pine nuts (optional)

1/4 cup olive oil

Crackers or baguette

Chop or rip the basil and put in a blender. Add grated parmesan cheese, pressed garlic, pine nuts, and olive oil. Blend until mixture is creamy. Serve over crackers or baguette.

Kids' Garden Tips:

- Pine nuts can get expensive, and the pesto still tastes great without them.
- Add flavor to your pesto by including such vegetables and herbs as broccoli, radishes, mint and chives.
- Using a hand-crank blender works perfectly to blend the mixture, and the kids love blending!
- Serve pesto on crackers, slices of bread, radishes or cucumbers.

Homemade Fattoush

(a Lebanese salad introduced to us by two of our youth gardeners)

Salad:

- 2 cups shredded lettuce
- 1 large or 2 small cucumbers, diced
- 2 medium tomatoes, chopped
- 1/2 cup chopped parsley
- 1/4 cup chopped mint leaves
- 1/2 to 1 green pepper, diced
- 1 bunch green onions, finely sliced
- 1/2 teaspoon sumac
- 2 pieces of pita bread toasted until golden brown, broken into pieces the size of a quarter

Dressing:

- 1/2 cup lemon juice
- 1/2 cup olive oil
- 2 to 4 cloves garlic, minced
- 1 teaspoon salt
- Pinch of pepper

In a small bowl, mix all dressing ingredients together. In a large bowl, mix all salad ingredients together. Toss salad with the dressing and serve immediately.

Troy Kids' Garden Tips:

- Break the pita bread into small 1" pieces and toast in a sun oven until the bread is warm to the touch.
- If ground sumac is not available, fresh red sumac berries can also be used. Soak the sumac in the lemon juice and mix it in with the dressing, instead of the salad.
- A small amount of balsamic vinegar can be added to the dressing to increase volume.

Kids' Garden Vegetable Pizza

Ingredients:

Marinara sauce (garden-fresh or store bought)

Pizza crust

Crackers

Whole wheat tortillas (or pita bread)

Mozzarella, Parmesan, or cheddar cheese

Any veggies fresh from the garden – try onion, garlic, broccoli, radishes, kale, green or red tomatoes, basil, or anything else that might be in season.

Harvest the vegetables from your garden and cut into small pieces. Spread pizza sauce on crust, crackers, tortillas, or pita bread and top with cheese (or you can make it without cheese for a vegan twist!). Add a variety of vegetables on each pizza and cook until the cheese is melted and sauce is warm.

Kids' Garden Tips:

- Use sun oven, earth oven, or wood burning grill to make the pizzas outside. The grill adds a strong smoky flavor.
- These can be made all summer long with any vegetables!
- Garden Pesto makes a great substitute for tomato sauce.

Kids' Garden Tips:

- If crackers aren't available to use, dip large pieces of vegetables into it (try broccoli, radish chips, carrots, kohlrabi, etc).
- Tortillas can be used in place of the crackers, or try the dip with spring rolls!

Garden Yogurt Dip

Ingredients:

2 cups plain yogurt

Dill

Crackers

Any veggies fresh from the garden – try onion, garlic, broccoli, radishes, kale, green or red tomatoes, cucumbers, basil, or anything else that might be in season.

Harvest the vegetables from your garden and cut into small pieces. Put yogurt in a small bowl and add vegetables. The more vegetables you add, the healthier it will be! You can blend the vegetables in a blender if desired, however whole pieces of vegetables work great (the yogurt also gets runnier the more it is mixed). Scoop the dip onto crackers and serve!

Cucumber Salsa

Ingredients:

3-4 large cucumbers

8 tomatillos

1 medium onion

2 garlic cloves

1 medium hot pepper

2 medium green (or red) tomatoes

Harvest and chop all of the vegetables in small chunks (the garlic can be minced or sent through a garlic press). Mix in a bowl until juices start to extract from the vegetables. Salsa can be served on crackers, chips, or with vegetable chips.

Kids' Garden Tips:

- Mashing the tomatillos with a spoon or fork makes the salsa juicier. It can also be blended in the hand-crank blender.
- If chips or crackers aren't available, the salsa can be served with large cucumber chips. They taste great!
- You could also put the salsa in spring rolls for a new taste sensation.

Resources & Acknowledgements

Youth Grow Local, Community GroundWorks at Troy Gardens

Youth Grow Local provides educators with a variety of useful garden-based education resources including curricula and professional development opportunities including conferences, courses and workshops. Young visitors will appreciate Veggipedia, a kid-friendly online encyclopedia of fruits and vegetables. Youth Grow Local also features the Youth Garden Portal, a site devoted to connecting educators to a broad array of resources for youth gardens. **www.communitygroundworks.org/what-we-do/youth-grow-local**

Nutrition, Physical Activity, & Obesity Program, Wisconsin Department of Health Services

Extensive resources related to obesity prevention strategies for multiple settings including community, school, and early childhood. Information and resources for promoting consumption of fruits and veggies are also available. **http://dhs.wi.gov/health/physicalactivity**

Wisconsin Nutrition Education Program, University of Wisconsin-Extension

A federally funded nutrition education program that helps limited resource families and individuals choose healthful diets, purchase and prepare healthful food and handle it safely, and become more food secure by spending their food dollars wisely. The program operates in most counties in Wisconsin, contact your county UW-Extension Office for more information. **www.uwex.edu/ces/wnep/overview/index.cfm**

Farm to School Program, REAP Food Group

A grassroots initiative whose goal is to enhance Wisconsin schools' existing meal programs by introducing fresh, nutritious, local and sustainably grown food to children. The program's website contains curriculum resources and also highlights unique ways of getting students interested in fruits and vegetables through the Snack and Chef in the Classroom Programs. **www.reapfoodgroup.org/Programs-Events/farm-to-school.html**

Life Lab

Life Lab is a non-profit organization and national leader in land-based education located in Santa Cruz, California. **www.lifelab.org**

Wisconsin Model Academic Standards for Nutrition Education & Nutrition Curriculum Guide

Provides excellent examples of age appropriate nutrition concepts and standards for grades 4, 8, and 12. **http://dpi.wi.gov/fscp/pdf/nestandards.pdf**

Wisconsin Model Academic Standards

Find additional ways to use your garden to meet other academic standards. **http://dpi.state.wi.us/standards**

The Nutritious Delicious Wisconsin Curriculum

Nutrition lessons for 4th grade students that can be used as part of their Wisconsin curriculum. These lessons are also a great complement to elementary farm to school programs. **http://dpi.wi.gov/ne/index.html**

Wisconsin Fresh Fruit & Vegetable Program

A USDA funded program that provides free fresh fruits and vegetables to children at participating elementary schools. The purpose of the program is to expand and increase the variety and amount of fruits and vegetables children experience and consume. **http://dpi.state.wi.us/fns/ffvp.html**

Wisconsin AmeriCorps Farm to School Program

The goal of the AmeriCorps Farm to School program is to provide an innovative approach to decreasing childhood obesity by promoting healthy eating habits in students and increasing access to local foods in schools. The program provides two half-time AmeriCorps members per site; a local food procurement member and a nutrition education member. **www.datcp.state.wi.us/mktg/business/marketing/val-add/farm_to_school/index.jsp**

National Fruit & Vegetable Program, Centers for Disease Control and Prevention

Several resources are available including a searchable recipe database for using garden produce; kid-tested fruit and vegetable recipe ideas; downloadable and free educational brochures for use with parent and school newsletters, and interactive bulletin boards; and fun facts that will capture students' interest in different kinds of fruits and vegetables found in the garden and beyond.
www.fruitsandveggiesmatter.gov

Harvest of the Month Toolkit-Growing Healthy Students

A great addition to any curriculum, the Harvest of the Month tool kit is comprised of four key elements designed to empower and motivate students to consume fruits and vegetables: educator newsletters, family newsletters, menu slicks and press releases. **www.harvestofthemonth.com**

Fruit & Vegetable Games for Kids

Find interactive games, artwork, and coloring and activity pages to get students interested in eating fruits and vegetables. **www.foodchamps.org**

MyPyramid for Kids Classroom Materials

Nutrition education materials for elementary-aged students that explore the food groups in MyPyramid (includes lesson plans, reproducible worksheets, and posters).
www.teamnutrition.usda.gov/resources/mypyramidclassroom.html

Got Dirt? Garden Initiative

Want to start a youth garden but have little or no gardening experience? Extensive resources including a toolkit for starting a garden can be found at:
www.dhs.wi.gov/health/physicalactivity/gotdirt.htm

Booklists

Books are a great addition to any lesson plan or activity! The following lists provide common garden and nutrition-related books for preschool to elementary-aged students.

- Blooming with Books (for Preschoolers & Kindergartener):
  www.rif.org/assets/Documents/StorySamplers/Gardening.pdf
- Michigan Team Nutrition—Grades K-2 Booklist:
  www.michigan.gov/documents/mde/UpdatedMichiganTeamNutritionBooklist_290287_7.pdf
- Michigan Team Nutrition—Preschool Booklist:
  www.michigan.gov/documents/mde/PreschoolBooklist_290284_7.pdf

Acknowledgements

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Phone: 608.267.9194
www.dhs.wisconsin.gov/health/physicalactivity/index.htm

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