



November: 3-5

All About Food Plants



South Carolina

Farm to School Lessons

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Overview

Welcome to the South Carolina Farm to School November Nutrition Education Lesson. This lesson contains information & hands on activities for teaching grades 3-5 about *whole food plants, specifically fruits & vegetables*. Our goal for this lesson is to help children understand why it is important to eat fruits & vegetables that they can get from supermarkets, farms & gardens close to where they live.

In order to achieve this goal students will explore why whole food plants are so special & beneficial for our bodies. In addition, students will explore different plants & from these, they will gain an appreciation that they eat many different parts of a variety of plants. Students will learn how to make half of their plates fruits & vegetables, & a quarter of their plate with grains. They will remember from the September F2S lesson that these foods should be whole rather than overly processed. To celebrate what they have learned in class, the class will make a salad with the Palmetto Pick of the Month. Students are encouraged to share what they have learned with their families & suggest their families to buy & eat more plant-based foods together.

These lessons are designed to be delivered over a four week period, noting that introduction & activities will be supplemental to existing curriculum.

Estimated Total time: 1 hour 20 minutes.

Teacher Background

The focus of this lesson is the importance of having a diet with a strong foundation of whole plant foods. While animal foods are often rich in proteins, vitamins, and minerals, they are also often high in saturated fat and cholesterol. Those substances start clogging blood vessels even in youths and increase the risk of heart attacks as people get older. Plants are truly special. Not only are they essential for all life on earth, but they produce hundreds of natural chemicals, such as vitamins and minerals that help every organ — from our heart to our brain — in our body working right.

The U.S.D.A.'s MyPlate recommends that about three-quarters of our plates be plant foods: half fruits and vegetables and about one-quarter grains, of which at least half should be whole grains. When students have the opportunity to experience whole plant foods with all their senses, as they get to do when they garden, cook, and eat foods from plants, they build their appreciation for eating plants just as they come from nature. Also, since foods from plants often have complex tastes that have bitter and/ or sour flavors, students need to try these foods many, many times to develop a liking for them.

View this lesson as a way to build an appreciation for eating plants, and for students to really believe that when they eat whole foods from plants, they are making choices that are good for their own health and good for the health of the planet.¹

¹ Lesson adapted from Food Day Lessons: Mostly Plants?

Lesson Checklist



F2S Aim: Increase the consumption of South Carolina fresh fruits & vegetables to half of their plate.

F2S Objectives

Students will be able to:

- * Appreciate the wide variety of foods that we can get from plants.
- * Identify edible plant parts.
- * List the health benefits of eating roots, stems, leaves, flowers, fruits & seeds.
- * Describe how to create a plate that has mostly fruits & vegetables.
- * Prepare a salad using the Palmetto Pick of the Month.



Materials:

- * Plants We Eat cards (Appendix A)
- * MyPlate activity sheet (Appendix B)
- * Plant Parts Titles (Appendix C)
- * Game Diagram (Appendix D)
- * List of Edible Food Plants (Appendix E)
- * Salad Grocery list: 1 head lettuce, 7 carrots, 1 turnip, 1 bunch celery, 1 pint cherry tomatoes, 8 ounces ready-to eat sunflower seeds, lemon juice, salt and pepper.
- * Kitchen Supplies: cutting boards, plastic knife, 1 spoon to serve dressing, 2 large spoons to toss & serve salad, 5-6 small bowls to hold chopped vegetables, 1-2 bowls to hold the salad, 1/2 bunch of broccoli paper plates & forks to serve/eat salad.
- * Gardening Supplies: turnips or lettuce seeds, small plastic bags and soil
- * Gardening journal.



National Health Education Standards

1.5.1	2.5.4	2.3.2	5.5.3	5.5.5
6.5.1	6.5.2	7.5.2	8.5.1	8.5.2

SC State Standards

ELA 4-2.2	Analyze informational text to draw conclusions and make inferences.
ELA 4-2.4	Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).
ELA 4-2.6	Use graphic features (including illustrations, graphs, charts, maps, diagrams, and graphic organizers) as sources of information.
ELA 4-4.1	Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).
ELA 4-5.3	Create written descriptions using language that appeals to the readers' senses.
ELA 4-6.2	Use print sources (for example, books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs) and non-print sources to access information
Science 4-2.1	Classify organisms into major groups (including plants or animals, flowering or non-flowering plants, and vertebrates (fish, amphibians, reptiles, birds, and mammals) or invertebrates) according to their physical characteristics.
Science 4-2.2	Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment)

Lesson Essential Components

Lessons profile	Page(s)	Yes	No	Notes
Palmetto Pick of the Month	6-8	★		Cooking & tasting activities with turnips
Health Education Standards	4	★		
SC-Cross Curricular Standards	5	★		
SC-F2S Behavioral Goals	4	★		
Cooking Activities	8-9	★		
Tasting Activities	8-9	★		
Physical Activity	7-9	★		Game: "The Plants Parts Challenge"
Food Safety	8	★		
School Food Garden	9	★		
Student to Farmer Connections (i.e. field trips, talks)			★	
Student to Chef Connections			★	
Farm to Cafeteria		★		
Provision of scientific knowledge/rationale	7-8	★		
Risk and benefits about healthy behaviors	8	★		
Obstacles, Barriers & Solution			★	
Family involvement and other supports	8	★		MyPlate Activity & Family Activity Letter
Set goals and monitoring progress			★	Action plan to follow MyPlate at the school lunch
Other hands on activities:	7-9	★		Team Activities

Let's Learn!

Why Plants are Special!^{1 2}

Estimated Time: 10 mins

1. Ask to the students the following question:
 - If there were no plants in the world, would we have food to eat?
2. Have a class discussion. At first, students might say they can eat food from animals such as milk, cheese, & meat. They might also say they can eat food like candy & cookies. Be sure the students think about what animals eat, & what foods like candy & cookies are made from. Have the students trace different foods back to plants (food chains). For example, eggs come from chickens, & chickens eat grains such as corn & oats. Continue the discussion until you feel your students are convinced that any food they can think of can be traced back to plants.
3. Remind your students that a large part of what we eat is made up of plants or parts of plants. In fact, plants contain many of the nutrients that help us live healthy lives.

Let's Learn

Investigate Various Parts of Plants & Their the Nutritional Benefits²

Estimated Time: 15 mins

1. Project or hold up each of the **Plants We Eat** cards (will be sent electronically) & point out that all the plants have roots, stems & leaves, but only some plants have flowers, fruits & seeds.
2. Explain that for each of these plants we typically eat only one part. For the carrots, tomato, & sunflower seeds, we choose to eat the part of the plant where the most part of the energy get stored. Two examples of plants that are completely edible are beets & turnips (Palmetto Pick of the Month). You may wish to show pictures of these two completely edible plants.
3. Have students work in six small groups.
4. Assign each group one plant part to read about (Appendix A).

5. After they have finished reading, give students several minutes to discuss what they have learned with their group members.
6. Invite a volunteer from each group to present what the group learned about their plant part.
7. You may wish to post this information on chart paper at front of the room.

Activity

The Plants Parts Challenge!³

Estimated Time: 15 mins

1. To reinforce the part plants, examples of edible plant parts & their nutritional benefits, play the game the "Plant Parts Challenge".
2. Lay out hula hoops on the floor. Placed "**Part Plants Titles**" (Appendix C) inside the hoops. Place pictures of edible food plants inside Center Circle (see diagram in Appendix D). Appendix E includes a list of food plants that you can use in your game.
3. Form two equally sized teams. At the signal to start the race, the first runner on each team, proceeds to the center circle, picks up a food plant item, & continues to his/her side placing the food plant item in the proper circle "Food Part Plant Title". He/She runs back and tags the next person in line who repeats the process. Play continues until all food plant items/pictures have been placed in a food part plant circle. After all food plant items have been placed, the teacher removes any items that were incorrectly placed & returns them to the Center Circle. Using time constraints & students' needs repeat the process. It may be necessary to gather & discuss placement of certain items.
4. Make sure students know the proper placement for all food plant items before ending the class session.
5. To give a bonus to each of the teams, you can ask them the nutritional benefits of each edible plant part.

Activity

Make Half Your Plate Fruits & Vegetables^{1,4}

Estimated Time: 15 mins

1. Hand out the **MyPlate activity sheet** (Appendix C).
2. Have students draw their school lunch from yesterday or today if they have already had school lunch (This could be used as a self-report dietary assessment).
3. Take a look at the Choose MyPlate activity sheet & have students compare their drawings to this plate.
4. Have the students notice that on MyPlate half the plate is fruits & vegetables because of all the nutrients that are in fruits & vegetables. Grains are about another quarter. Make at least half of these whole grains, such as brown rice and whole grain pastas & breads. Taken together, that is three-quarters of the plate! (Note that protein foods include animal sources, such as lean meat, poultry, fish, & low fat dairy foods & plant sources, such as beans, seeds, & nuts.)
5. Explain that using this plate is a way to remind us that when we eat meals, we want to cover most of our plate with foods from plants. Encourage students to fill their plate with whole, real foods, following the proportions of MyPlate. Snacks of overly processed foods, such as sugary drinks, candy, chips & processed packaged baked goods, are items that we can have once-in-a- while rather than as a regular part of what we eat.
6. Have the students draw in a portion of vegetable they like to fill in the vegetable section, a fruit to fill in the fruit section, a grain, & a protein as well. That way they have a visual of what a plant-based plate looks like filled with foods they like.
7. Encourage the students to share their plate with their families so they can also have plant-based meals.
8. Remind students to get SC Grown fruits & vegetables from their nearest supermarket, farm, garden or farmer's market.

9. Suggest an action plan to follow Choose MyPlate for at least three lunches at school & two dinners in the next week.

★ Palmetto Pick Activity

Cooking Veggie Salad with Crispy Turnips²

Estimated Time: 15 mins

1. Have students wash their hands (with soap & warm water for 20 seconds) & reinforce that it is important. Show the students that you have washed all the salad ingredients before beginning.
 2. Divide the class into 3-5 groups. Give each group some lettuce, carrots, celery, tomatoes, & turnips to cut. This method makes students feel involved in the salad making process. As students are preparing the salad, make the dressing using lemon juice, salt & pepper.
 3. You may wish to demonstrate cutting techniques (show different shapes: dices, sticks, slices, stars) & tell the students to be careful with all knives (even plastic knives can hurt people).
- Note:* If you are not comfortable having students cut the vegetables, please either ask parents/volunteers to assist with this activity or pre-cut the vegetables prior to activity.

Ingredients:

- 1 SC locally grown turnip
- 1 head dark green lettuce, such as romaine
- 7 carrots
- 1/2 bunch of broccoli
- 5 stalks of celery (from the bunch)
- 1 pint cherry tomatoes or 7 larger tomatoes
- 8 ounces ready-to-eat sunflower seeds
- lemon juice, salt and pepper

Directions for the students:

- Put in some **LEAVES**: Use your hands to tear the lettuce into bite-sized pieces.
- Put in some **ROOTS**: With the plastic knife, cut the carrots & turnips into slices & bite-sized pieces, respectively.

- Put in some **FLOWERS**: With the plastic knife, cut the broccoli into bite-sized pieces.
- Put in some **STEMS**: With the plastic knife, cut the celery into bite-sized pieces.
- Put in some **FRUITS**: With the plastic knife, cut the tomatoes into bite-sized pieces.
- Place all the ingredients in the salad bowl.
- Put in some **SEEDS**: Sprinkle a small handful of sunflower seeds over the salad.
- Gently toss the salad just until it looks mixed. Be careful to not over-mix, which may damage the vegetables.
- Serve salad on the plate. Add lemon juice, salt & pepper. Enjoy.

Note: Remember, that you can use the Farm to School grant funds to purchase the F&V required for this lesson. Remind your students to look for the Palmetto Pick of the Month in their school lunches to learn other ways of preparing & serving turnips.

★ Gardening Activity

How to Grow Turnips or Lettuce

Estimated Time: 10 min

Materials Needed:

Pot or Heavy-duty lock-type freezer bag
(Pint/Quart)
Turnip or Lettuce seeds
Potting Soil
Water (spray bottle works well)

Directions:

- Fill a pot or plastic bags 3/4 of the way with good potting soil.
- Take a pinch of seeds & sprinkle on the surface of the soil.
- Cover the seeds lightly with soil.
- Water seeds with light spray. If you are using bags, close the bag, leaving one inch open. (Cut off corners of the bag to allow for drainage)
- Set in a sunny window or area.
- When you see little green shoots, open the bag wider so that plants has room to grow & can breathe.

- Your plants need attention & care. You must water them properly & make sure your plants get enough light.
- Lettuce will grow fast in warm temperatures. Ideal temperature is 65-70 degrees F.
- Measure, discuss, describe & record observations in your gardening journal on the growth of your plant.

Note: This activity could be done individually (with items such as pots, plastic cups, gloves or freezer bags) or as a class in the school garden.

Evaluation

Formal Assessment:

1. Review **Parts of a Plant** & discuss the important job each part has to offer.
2. Review Gardening Journal.

Informal Assessment: Observe participation in lesson activities. Complete survey at end of month (survey will be sent electronically).

¹ Source: Food Day Lessons (Lesson 2: Mostly Plants).

² Source: Growing Food Curriculum (Unit 2: Plants)

³ Adapted from: The Farmers Grow a Rainbow at <http://www.agclassroom.org/rainbow/lessons.htm>

⁴ From Empowering Kids to Choose MyPlate Lesson Plans (Category: Make Half Your Plate Fruits and Vegetables)

Resources



Books:

From Seed to Plant by Gail Gibbons

The Vegetables We Eat by Gail Gibbons

Growing Vegetable Soup by Lois Ehlert. An introduction to the garden for young folks.

Websites:

Digging Deeper into Plants

Activities and Resources to Extend this Lesson

Trade Vegetable Trading Cards: <http://www.agmkt.state.ny.us/f2s/resources.html> A great way to get your students excited about eating vegetables is to collect cool trading cards with exciting facts about why to eat vegetables. Check them out!

Teach About our Food Production system: <http://blogs.tc.columbia.edu/cfe/education/nutrition-curriculum/growing-food/> Help your students appreciate the food production system by teaching Growing Food, a part of the Linking Food and the Environment (LiFE) Curriculum Series.

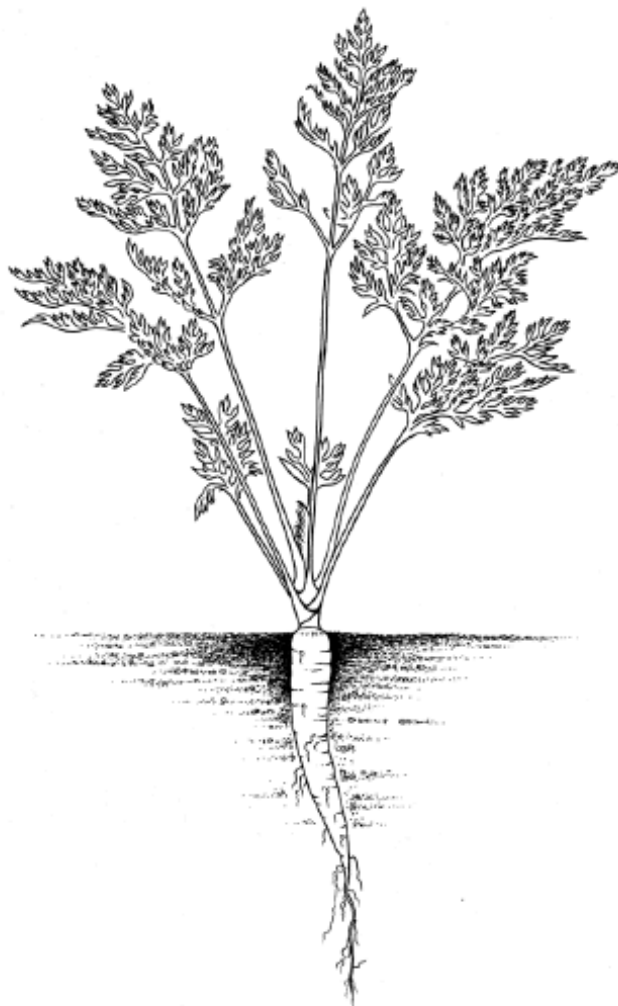
Create Art Inspired by Plant-based Foods: <http://www.artandhealthyliving.org/> When we create art, we use observation skills and build appreciation for what we are observing. Use Studio In A School's Art & Healthy Living program as inspiration for your own ideas for connecting eating mostly plants with the creation of art.

Appendix A (pages 11-16)
Plant Parts

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



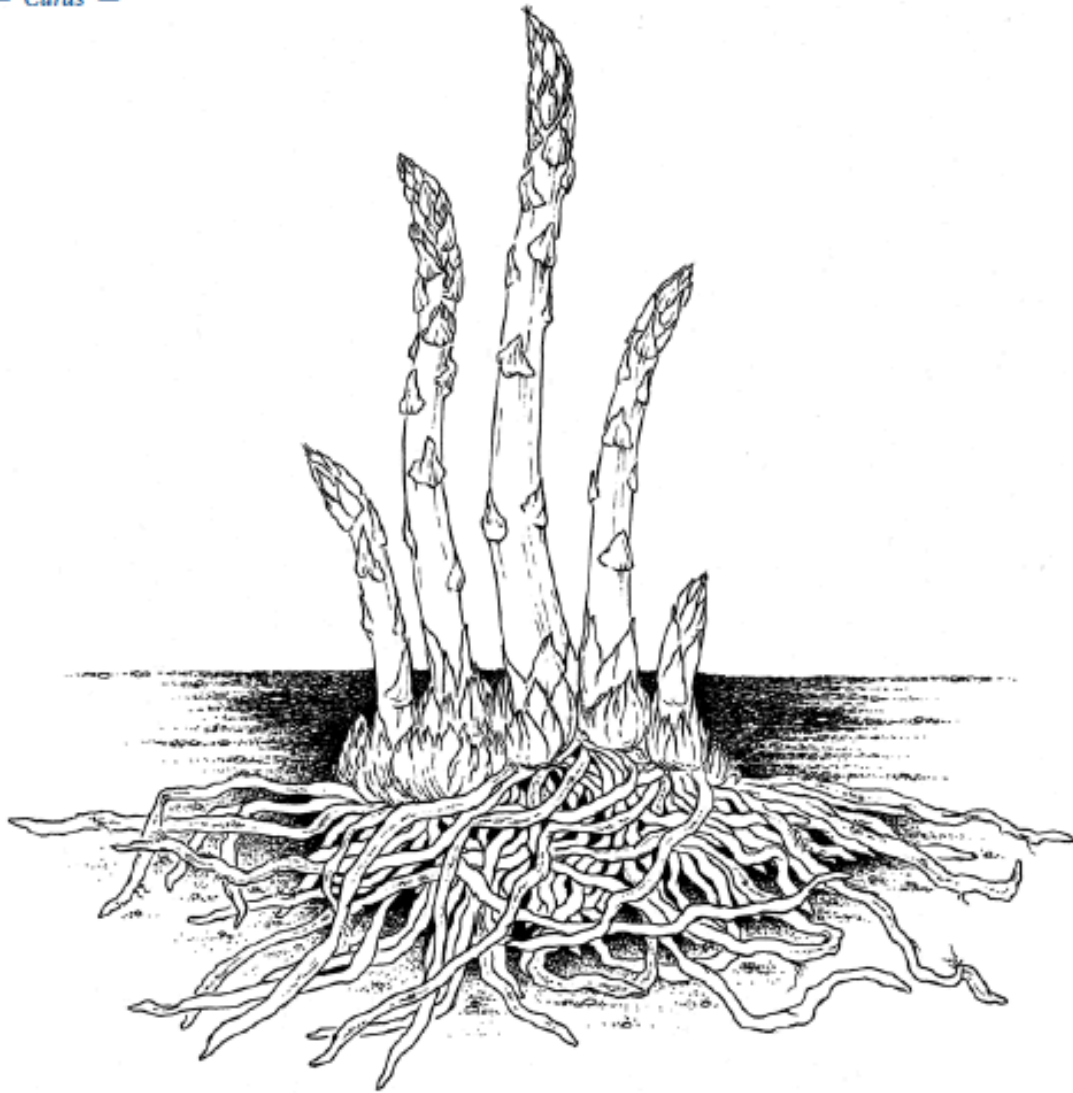
Examples of roots we eat: beet, carrot, cassava, horseradish, lotus root, parsnip, rutabaga, sweet potato, turnip

Nutritional benefits of eating roots: Orange roots, such as carrots and sweet potatoes, are good sources of vitamin A. Vitamin A can help us see well in the dark. Other root vegetables are good sources of fiber and complex carbohydrates, and various phytonutrients that can help every part of our body. For people who live in climates that are cold in the winter, roots are great vegetables to eat all winter long since they can be stored for a long time, are hardy and filling, and are loaded with nutrients we need.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



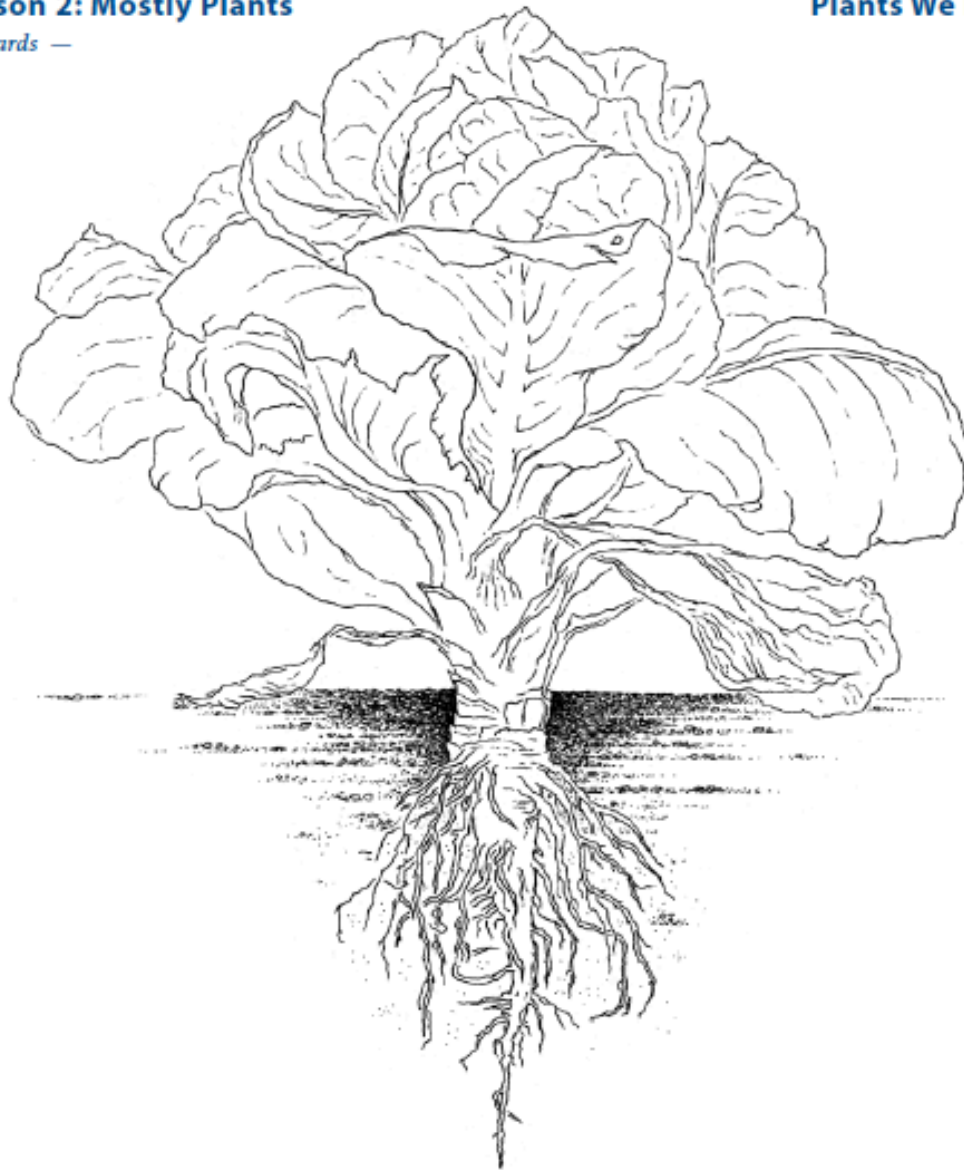
Examples of stems we eat: asparagus, garlic, ginger, white potato. Did you know that garlic and white potatoes are really underground stems of the plant? Garlic is a bulb. Potatoes are tubers that are underground swellings in the stem that store energy and other nutrients for the potato plant. Celery is a stalk, or leaf stem. The true stem of the celery plant is the base where all the stalks come out.

Nutritional benefits of eating stems: Asparagus are one of the first plants that come up in the spring. They are rich in potassium and phytonutrients. Other stems are also rich in these same nutrients.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



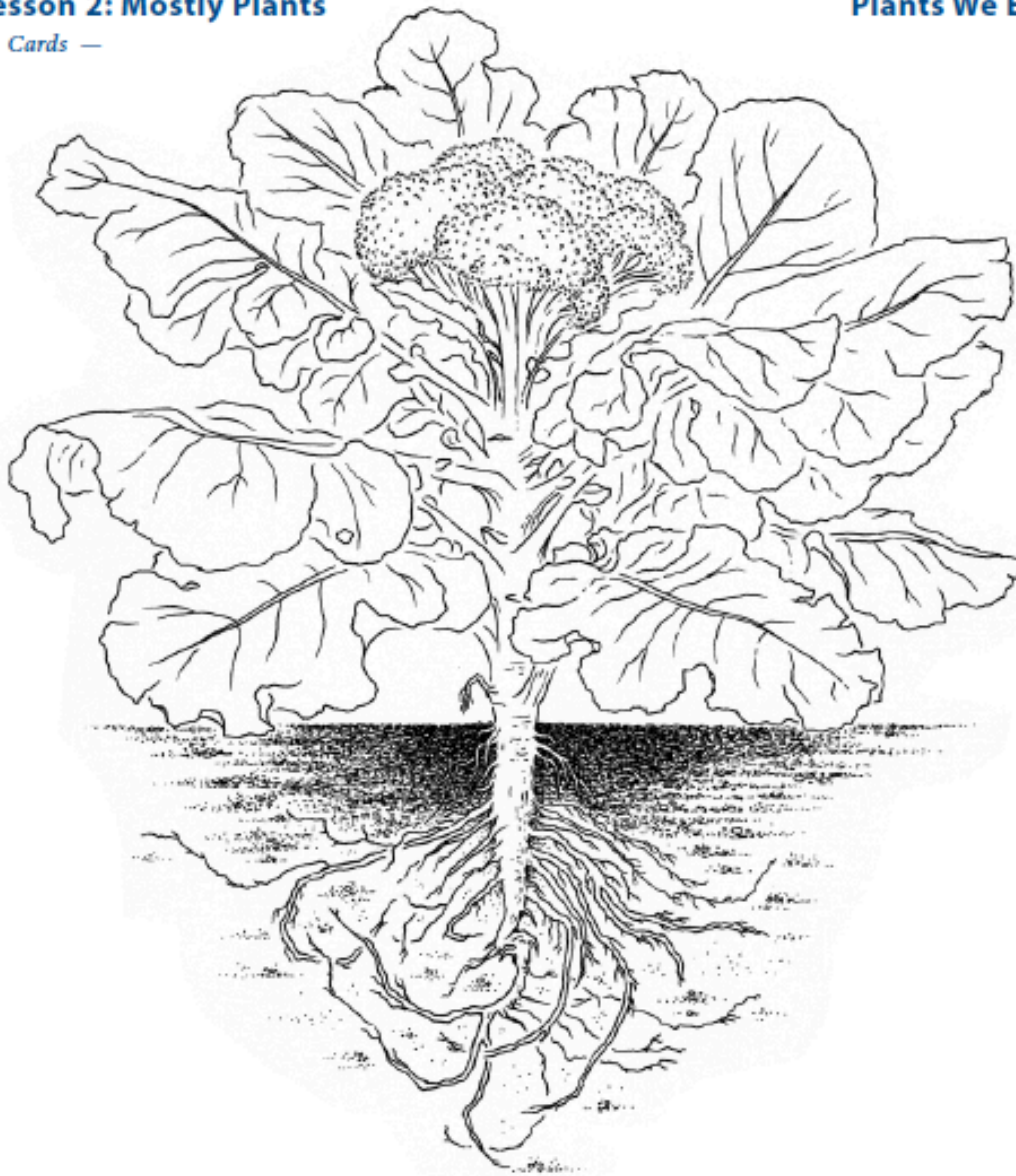
Examples of leaves we eat: basil, beet greens, cabbage, cilantro, collards, kale, lettuce, mustard, parsley, spinach

Nutritional benefits of eating leaves: Leaves are good sources of calcium, iron, many vitamins, and various phytonutrients. The darker green the leaves, the more packed with nutrients. Since leaves are low in calories and high in nutrients, they are one of the most nutrient dense foods we can eat. Leaves are available in the late spring, summer and fall, and might also be available in the winter in warmer climates.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



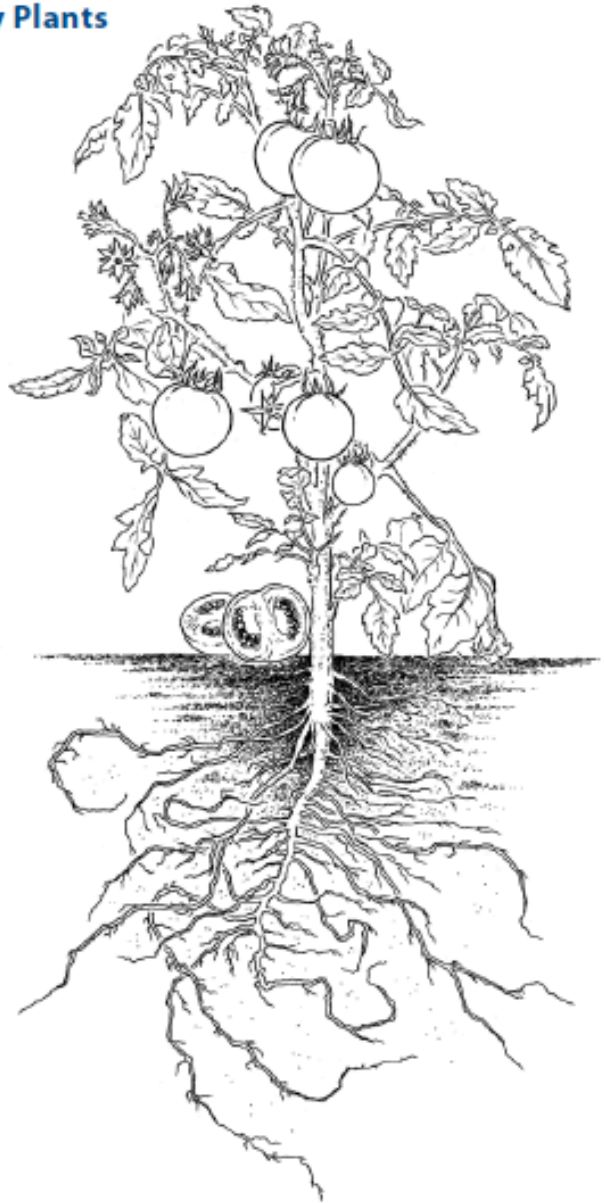
Examples of flowers we eat: borage, broccoli, calendula, cauliflower, chive blossoms, garlic blossoms, nasturtium, squash blossoms, violets

Nutritional benefits of eating flowers: Flowers come in various colors and shapes, and different flowers have different nutrients. Eating flowers can give us the phytonutrients that can help us stay healthy now and prevent diseases in the future.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



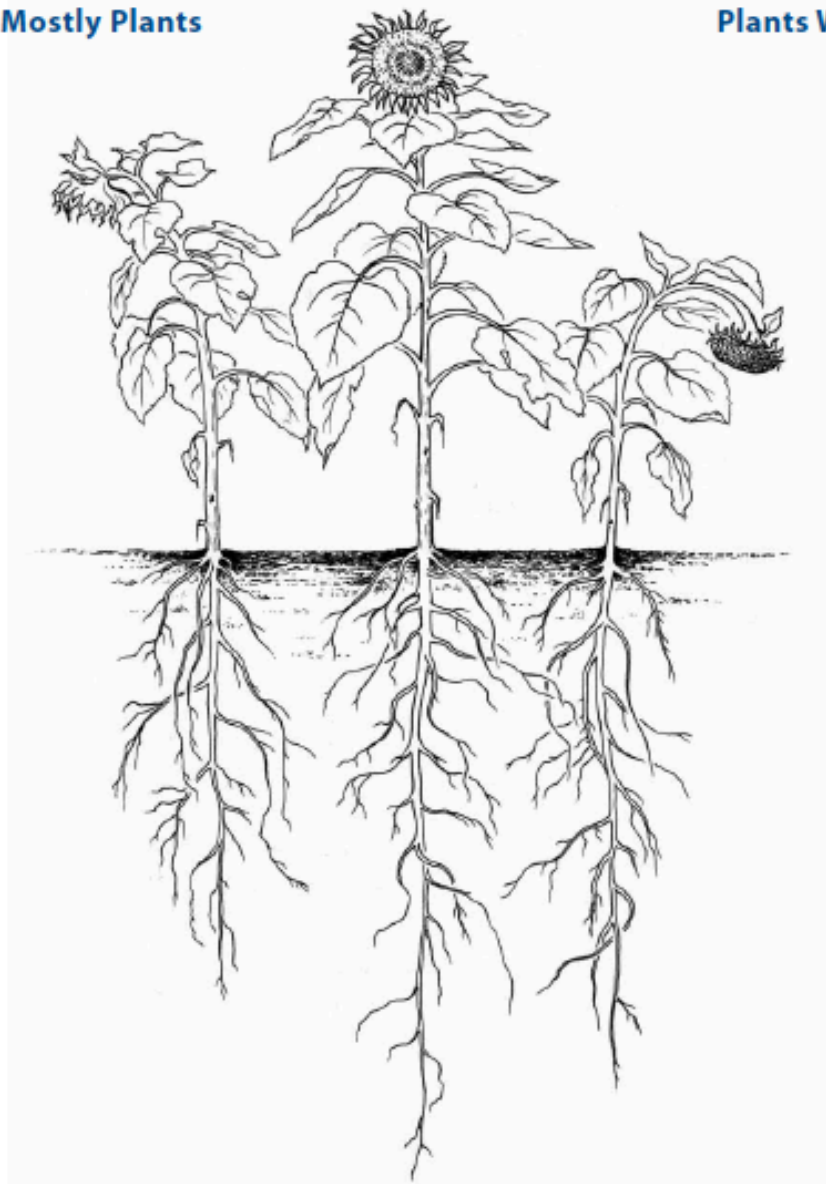
Examples of fruit we eat: vegetables that are the fruit of the plant: cucumbers, peppers, squash, string beans, tomatoes, zucchini; **fruit examples:** apples, blueberries, cantaloupe, grapes, oranges, peaches, pears, plums, raspberries, strawberries, watermelon

Nutritional benefits of eating fruit: Fruits come in so many different colors! Just about all fruits have fiber and complex carbohydrates. Various different colors are rich in different vitamins and phytonutrients. When having fruit, choose a wide variety of colors.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



Examples of seeds we eat: seeds that are grains: barley, oats, quinoa, rye, wheat; seeds that are good sources of protein: black beans, cashews, chick peas, kidney beans, peanuts, pinto beans, sunflower seeds

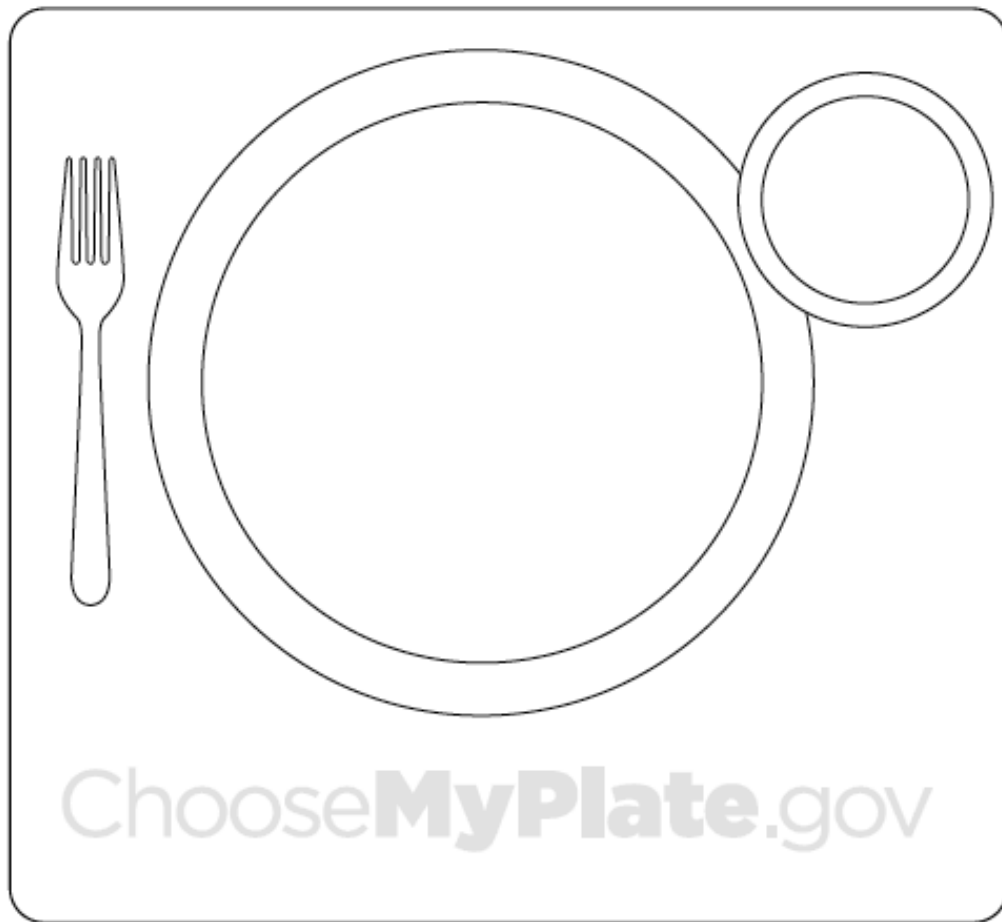
Nutritional benefits of eating seeds: Grains are a good source of complex carbohydrates, fiber, and B vitamins. The seeds that are the good sources of protein also have fiber and various phytonutrients. Beans are great as part of a meal, and nuts and seeds can be sprinkled over vegetables and/or grains as the protein part of a meal.

Appendix B
MyPlate Activity Sheet

— Activity Sheet —

Name	Date
------	------

Below is a picture of a plate and a cup. Draw what you ate and drank for lunch yesterday or today. Think about how much space each item took on the plate and make your drawing as accurate as possible.



Name _____

Date _____

This is MyPlate! When you follow MyPlate, at least three-quarters of your plate is plants. The **amount** you should have in each section is shown. You might fill the Fruit section with apple slices, a peach, or some blueberries. Fill the Vegetables section with carrots, string beans, zucchini, or other vegetables. Fill your Grain section with whole-grain bread, pasta, or brown rice. Your Protein section can consist of animal-based proteins such as chicken, fish, or beef, or plant-based proteins such as beans or tofu. For the Dairy section you can have an 8-ounce glass of lowfat milk, lowfat yogurt, or a piece of cheese.



On the plate below, draw a meal that you would like to eat that follows the amounts shown on MyPlate. Over the next week, try to eat a MyPlate lunch three times at school and a MyPlate dinner two times. Share MyPlate with your family!



Days I followed MyPlate at **school lunch**:

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday

Days I followed MyPlate at **dinner**:

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday

Appendix C
Plant Parts Titles

ROOTS

STEMS

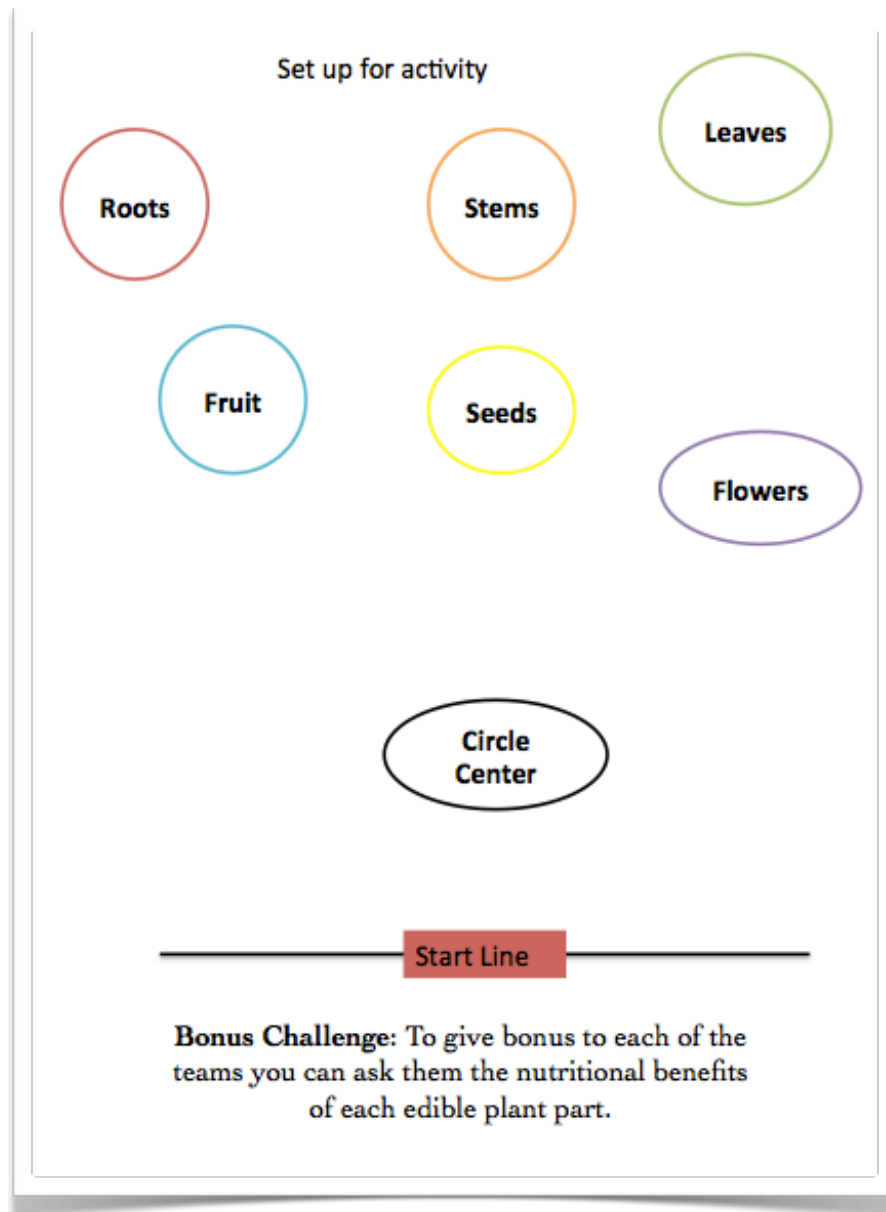
LEAVES

FLOWERS

FRUIT

SEEDS

Appendix D
Game Diagram



Appendix E
List of Edible Plants

(You may wish to get pictures of these foods).

ROOTS	STEMS	LEAVES	FLOWERS	FRUITS	SEEDS
Carrots	Celery	Kale	Broccoli	Tomato	Lima Beans
Beets	Rhubard	Lettuce	Cauliflower	Apple	Peas
Turnips	Onions	Spinach	Squash blossoms	Cucumber	Green Beans
Rutabagas	Garlic	Cabbage	Violets	Strawberries	Sunflower Seeds
Sweet Potatoes	Asparagus	Collards	Chive blossoms	Watermelon	Black-eyed Peas
Cassava	Ginger	Parsley	Garlic blossoms	Peaches	Pinto Beans