**Lesson 3:**

**Parts of a Plant**

Students will be able to identify the different parts of a plant and describe how plants grow. They will be able to group familiar foods by both plant part and food group, and recognize the importance of eating a variety of plant-based foods.

**Materials**
- Example whole plants to demonstrate all parts of a plant (see preparation)
- Plant part handout (Appendix 3A)
- Crayons or colored pencils for labeling and optional coloring
- Plant life cycle diagram and cards (Appendices 3B & C)
- Variety of seeds for relatively quick-growing plants (radishes, lettuce, spinach, green onions)
- Potting soil
- Egg cartons or newspaper and bottles to make containers

**Preparation**
Find example plants (could be full plants or a combination of vegetables to show different parts: carrots, beets, onions, and/or radishes with roots and stems/leaves, broccoli, cauliflower or other flowering plants with stems and leaves, fruits attached to stems and leaves like tomatoes, peas, beans, and/or berries). Harvest, or prepare to harvest with students. Grate root vegetables, cut up broccoli/cauliflower florets for snack, and prepare dips. Put all snack components in serving bowls.

**Objectives**
Students will be able to identify the different parts of a plant and describe how plants grow. They will be able to group familiar foods by both plant part and food group, and recognize the importance of eating a variety of plant-based foods.

**Time**
One hour: 10 minute introduction, 15 minute lesson, 15 minute planting activity, 15 minute snack, 5 minute wrap-up

**Lesson/Activity**
- Example whole plants to demonstrate all parts of a plant (see preparation)
- Plant part handout (Appendix 3A)
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- Variety of seeds for relatively quick-growing plants (radishes, lettuce, spinach, green onions)
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**Snack**
- Chard or lettuce leaves
- Grated carrots/beets/radishes
- Broccoli or cauliflower florets
- Sunflower/pumpkin seeds and/or cooked whole grains like rice
- Serving dishes and utensils

**Take home**
- Recipes
- Newsletters
- Grocery bags
- Individual dishes and utensils, napkins
- Hummus or ingredients for dip (could be yogurt and herbs for ranch or tsatziki, soy sauce/ginger/honey for dipping sauce)

This curriculum is made possible by a partnership between The Campus Kitchens Project and Sodexo Foundation. Find other nutrition education plans at campuskitchens.org.
**Plant life cycles:** Annuals pass through the entire life cycle in one growing season; biennials develop stems, roots and leaves during their first growing season and flowers, fruit and seeds during the second (examples are beets, carrots, onions); perennials live for many years and usually produce flowers and seeds each year.

**Plants that animals eat:** When explaining how all the food we eat comes from plants, you can generalize that the animals that we eat (or that produce foods we eat like dairy products and eggs) eat plants as well. With older students, you may want to discuss what parts of the plant animals eat: traditionally (and on some farms today) chickens eat mostly seeds (and bugs), goats and pigs eat many different plant parts, and cows eat stems and leaves.

**Functions of different plant parts:**

<table>
<thead>
<tr>
<th>Plants</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roots</strong></td>
<td>Anchor the plant in place, absorb water and nutrients from the soil, and store food for the plant</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stems</strong></td>
<td>Store and carry water and nutrients throughout the plant.</td>
</tr>
<tr>
<td></td>
<td>Hold the plant fairly rigid and upright</td>
</tr>
<tr>
<td><strong>Leaves</strong></td>
<td>Gather sunlight and convert the light into food for the plant (photosynthesis)</td>
</tr>
<tr>
<td></td>
<td>Veins or ribs on the leaf carry nutrients.</td>
</tr>
<tr>
<td></td>
<td>The top and bottom layers of a leaf are called the “epidermis” (like our skin) and protect the leaf tissue</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>Produce seeds so the plant can reproduce</td>
</tr>
<tr>
<td></td>
<td>Seeds within cannot germinate until the fruit either rots or is eaten by an animal and the seeds are then scattered</td>
</tr>
<tr>
<td><strong>Flowers</strong></td>
<td>Attract birds and insects to pollinate the plant so that it can reproduce</td>
</tr>
<tr>
<td></td>
<td>Plants also have buds, which are the embryonic forms of either leaves or flowers (when we eat broccoli and cauliflower we are really eating buds, not flowers)</td>
</tr>
<tr>
<td><strong>Seeds</strong></td>
<td>Enable plants to reproduce</td>
</tr>
<tr>
<td></td>
<td>Seeds have three parts: the embryo that develops into the new plant, the endosperm that contains food for the embryo, and the seed coat that protects the seed</td>
</tr>
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<td></td>
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</tr>
</tbody>
</table>

**Suggested academic connections:**

- Discussion of the life cycle of plants could link to science standards/curricula.
### Introduction

**Review.** Ask students if they remember what plants need to grow. What different nutrients do people need to eat in order to be healthy and grow? What is one very important nutrient that both plants and people need? (Water!)

**Bridge.** Ask students about some of their favorite foods from the different food groups, making lists if possible. Choose a few plant foods from different groups and ask what part of the plant we're eating when we eat those foods. If students have suggested animal foods, ask what animal those foods come from and what plants or parts of a plant that animal might eat. Ask about what color different foods are and remind them about the importance of “eating the rainbow” (see *Building Blocks for Healthy Kids* curriculum).

### Lesson

**Explore.** Using example plants, or allowing students to pick a few of their own from the garden or other outdoor area, identify the different parts of a plant—roots, stem, leaves, flowers, and fruit/seeds. Pass out plant part handout and have students read out loud the different functions of each part, then label the drawing (coloring optional).

**Explain** how plants develop each part as they grow: seeds are usually planted in the dirt, although they can grow with just sun and water (if nutrients are provided through another medium). The seed grows roots, and then a stem which reaches towards the sun with leaves that collect the sun's energy. When the plant is big enough it grows flowers, which turn into fruit that ripens and falls so that the seeds inside the fruit can grow more plants. Show them the plant life cycle diagram and ask them to name which part of the plant each vegetable is on the plant part cards. (With more time, you can skip the demonstration and have students arrange the plant part cards themselves—see additional activities.)

### Activity

*See Teaching Guide page 6 for additional activity suggestions*

**Plant seeds to take home.** Show students different varieties of seeds, checking that they recognize the plant names, and ask what part of the plant we will eat once these seeds grow into plants that are ready to harvest. Let students choose what to plant and put soil in an egg carton section or newspaper cup (wrap paper around the bottom of a 12-ounce bottle, tape, and remove bottle) and fill it with soil. Invite them to plant three seeds in each cup and explain that this is in case not every seed germinates. Remind them to put their seed in a sunny place and give it a little water every day.  
**Optional:** Depending on timing and the age of the students, you may choose to read a book to the group. We recommend *From Seed to Plant* by Gail Gibbons.

### Snack

**Make plant part wraps.** Show students the different foods and ask what parts of the plant they are. Let them assemble wraps: spread hummus on chard or lettuce leaf, place flowers, seeds, chopped stems, and grated roots on top, and wrap leaf around filling. Or skip the spread, let students mix dip and shake in jars (if time allows and you haven't pre-mixed the dips), wrap plant parts, and dip. Optional: ask if students know what hummus or soy sauce are made from—a good opportunity to highlight more uses of seeds!

### Wrap Up

**Review lesson.** Who can name some parts of a plant? What are different leaves, roots, and flowers that we eat? Emphasize that eating a variety of different plant parts can help us get all the nutrients we need. How does the plant part wrap taste? What other foods could we put in this wrap?

**Take home.** Give each student a copy of the take home recipe and newsletter, relevant garden produce if possible, grocery bag, and seed pot.
Hearty Fresh Vegetable Soups

Soups can make a filling and nutritious meal when they combine beans and vegetables from all the different parts of a plant. You can use a variety of spices and flavors to complement whatever vegetables are available. Use the first ingredient list as a base and then explore different variations. Try adding grains to make an even heartier soup, or serve a slice of toasted whole-grain bread or crackers on the side.

**INGREDIENTS**

serves 4-5

- 1 ½ tablespoons canola or olive oil
- 1 medium onion, diced
- 2-4 large cloves garlic, crushed

**CURRIED VEGETABLE SOUP**

- Vegetables to try: celery, carrots, sweet potatoes, cauliflower, tomatoes (canned or fresh), bell pepper, zucchini, squash, kale
- Seasonings: 2 teaspoons curry powder, 1 teaspoon cumin, ½ tsp turmeric, ½ tsp salt
- 1 can chickpeas*
- 1 (14 oz) can light coconut milk or 1 cup peanut butter
- 1 cup cooked brown rice

**ITALIAN MINESTRONE SOUP**

- Vegetables to try: tomatoes, celery, carrots, potatoes, zucchini, bell peppers, green beans, broccoli, kale or chard
- Seasonings: 1 teaspoon dried or fresh chopped oregano, 1 tablespoon dried or fresh chopped basil, salt and pepper to taste
- 1 can red, navy, cannellini beans, or chickpeas*
- 2 cups cooked pasta

**WARM LENTIL SOUP**

- Vegetables to try: celery, carrots, sweet potatoes, corn, tomatoes, bell peppers, squash, spinach or chard
- Seasonings: 1 teaspoon paprika, 1 teaspoon ground cumin, ¼ cup tomato paste
- 1 can lentils*
- 1 cup cooked barley

**DIRECTIONS**

*For dried beans or lentils, follow package instructions to cook.

1. Heat oil in a medium stockpot over low-medium heat.
2. Add the onion and sauté until soft, about 5 minutes.
3. Add the garlic and sauté for about 1 minute.
4. Add the vegetables and seasonings and sauté for 5 minutes (start with tougher vegetables like carrots or potatoes and add softer vegetables later).
5. Add the broth, beans, and tomatoes (if using) and bring soup to a boil.
6. Reduce heat to a simmer and cook until vegetables are tender.
7. If including kale or other greens, add during the last five minutes of cooking along with cooked grains or pasta and coconut milk or peanut butter for curry.

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Leaf: turns sunlight into food for the plant
Flower: attracts birds and insects to spread pollen and make seeds
Fruit: stores and protects the seeds
Stem: carries water and nutrients through the plant and provides structure
Seed: grows into a new plant
Root: takes water and nutrients from the soil, stores food and anchors plant in the ground
Life Cycle of a Plant

- Seed
- Stem
- Leaf
- Root
- Flower
- Fruit
PLANT PART VEGGIE CARDS

CORN

CARROT

CELERY

CABBAGE

BROCCOLI

CHERRIES
Dear families,

Today we learned about how plants grow and the different parts of plants that we eat. Here are examples of different foods we eat that come from each stage of a plant’s life cycle:

<table>
<thead>
<tr>
<th>Seeds</th>
<th>Roots</th>
<th>Stems</th>
<th>Leaves</th>
<th>Flowers</th>
<th>Fruits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>Carrots</td>
<td>Celery</td>
<td>Cabbage</td>
<td>Broccoli</td>
<td>Cherries</td>
</tr>
</tbody>
</table>

Conversation Starters

Here are some of the nutritional benefits of eating different plant parts:

- Roots: Carrots, beets, sweet potatoes, radishes - Provide fiber and complex carbohydrates
- Seeds: Rice, corn, beans, sunflower seeds - Orange roots like carrots and sweet potatoes are a great source of Vitamin A
- Leaves: Spinach, collards, kale - Dark green leaves are packed with calcium and iron
- Stems: Asparagus, celery - Grains provide complex carbohydrates and B vitamins
- Flowers/buds: Broccoli, cauliflower - Beans and seeds provide lots of protein
- Fruits: Berries, peaches, tomatoes, peppers, melons, eggplant - Lots of potassium and disease-fighting phytonutrients

Family Activity: Grow your own plant!

Your student may have brought home a seed pot planted with __________ today. To help your seeds grow, place the pot in a sunny spot (indoors or out) and give it a little water every day.

You can record the stages in your plant’s growth here:

Saw a shoot (day): __________
Saw two leaves (day): __________
Ready to transplant (getting too big for the pot)! Carefully remove from pot, measure root length: __________
First flowers (day): __________
First fruits (day): __________