**Plant Parts**

**Become Me!**

**Lesson 2**

**CONTENT OBJECTIVES**
Identify the basic and edible parts of plants and their functions, Make connections between plants and personal food choices

**LIFE SKILL OBJECTIVES**
Critical thinking; Communicating by singing, group work, and responding to questions and instructions; Learning to learn; Cooperation; Healthy lifestyle choices

**INDICATORS**
Correctly assemble plant parts; Work with groups and individually to match pictures of fruits, vegetables and seeds to the part of the plant they come from; Increase fruit and vegetable consumption by tasting new ones

**EVALUATIONS**

**SUBJECT STANDARDS**
Science: Life (characteristics of organisms), Science in personal and social perspectives (personal health, types of resources)
Language Arts: Vocabulary, Reading, Factual understanding, Main idea, Interpreting, Inferring, Sequencing, Summarizing, Character development
Math: Number and operations, Algebra, Data analysis and probability
Social Studies: Individual development and identity; Production, distribution and consumption; Individuals, groups and institutions; People, places and the environment

**LEARNER TYPES**
Linguistic-words, Logical-mathematical, Spatial-visual, Music, Bodily-kinesthetic, Interpersonal, Intrapersonal, Natural

**MATERIALS**
Vegetable Garden Cards (copy and cut one card per student, found at the end of this lesson)
Flower head that forms seeds (optional – sunflower, dried marigold, coneflower, or zinnia seed heads)
Roots, Stems, Leaves and Flowers activity sheet (one per student, found in the back pocket)
Crayons or markers
Scissors
Construction paper or paint stir sticks (see Do section; Roots, Stems, Leaves and Flowers activity options)

*MATERIALS LIST continued on next page*
**INTRODUCTION**

Let’s pretend that it is spring and we are seeds that have been planted in the ground. Curl up on the floor or “ground” like a seed in our garden. The soil or ground is all around you. Above ground is above your desks or tables. Now, let’s grow slowly into a plant. The spring rains have come down and softened our seed coat so that our roots start to grow into the soil.

**What part of your body can you use to become roots?**
Your feet and legs are the roots growing out of the seed and pushing down into the soil. Roots are the first plant part to emerge or grow out of seeds. Wiggle your toes as your roots start growing out of the seed.

**What happens next?**
The stem starts pushing its way up out of the soil.

**What part of your body is the stem?**
Your body is the stem. Wiggle your bottom, shoulders and elbows. Pop up your head and start growing tall. Stand up tall and straight so that your stem is growing above the ground.

**Once the stem has pushed its way through the soil, what grows next?**
Leaves and branches start to grow.

**What parts of your body could be the leaves and branches?**
Your arms could be branches and your hands and fingers could be leaves. Put your arms out away from your body and wiggle your hands and fingers as if they were leaves fluttering in the breeze. Reach toward the sky to catch the sun’s rays.

Stand up straight with your head held high and a big smile on your face because your head is a beautiful flower on top of a sturdy stem. Move it back and forth like it is enjoying the sunshine and the breeze.

*You may want to repeat the seed to plant activity.*

**Now that you are a plant, what kind of plant are you?**
Flower
Besides pretty flowering plants, what are some other plants that produce flowers? Nearly all plants produce flowers, including fruit trees, strawberries, soybeans, corn, many vegetables, herbs, and even grasses.

If you were a fruit tree, what kind of fruit would you produce? Apple, pear, cherry, plum, peach, coconut, etc.

Today, we are going to explore the parts of plants after they have grown from a seed to become fully grown plants.

**DESIGNING PLANTS**

Do you know the song “Head, Shoulders, Knees and Toes”? Stand away from your chairs and let’s sing the song and do the motions together. (Do the traditional hand motions and whatever tune you are familiar with. The students might be able to lead it for you.)

If your body was a plant…

what part of your body would be the flower? Your head with a bright, beautiful smile

what part of your body would be the leaves? Your arms and hands reaching out for the sun

what part of your body would be the stem? Your body taking food and water to all the branches, leaves and flowers

what part of your body would be the roots? Your feet holding the plant securely in the ground

Let’s practice hand motions to replace head, shoulders, knees and toes with flowers, leaves, stems and roots. Open your hands like petals on a flower on both sides of your head and say “flower.” Hold out your arms and hands and say “leaves.” Touch your waist and say “stem.” Reach toward your feet and say “roots.” Now, let’s sing the “Head and Shoulders” song using the parts of the plant. (When you come to the part that is usually “eyes and ears and nose and mouth” just keep singing “flowers, leaves and stems and roots.” Sing it once slowly and a second time a little faster.)

Distribute the Roots, Stems, Leaves and Flowers activity sheet.

Look at the pictures on the activity sheet and tell me the four parts of a plant. Every picture in the first column is a root. Every picture in the second column shows a stem and leaves. Every picture in the third column is a flower. Color your plant parts however you like.

After you have colored the pictures, you can design your own plants. Carefully cut out the boxes with the pictures. Mix them up and design your favorite combination to make your plants, each with a top, middle and bottom in the correct order.

After the students have colored, cut and lined up their plants, they can attach the parts in any of the following ways.

1. Staple or glue them on paint stir sticks so that the students can carry them around like stick puppets and pretend to plant them in a flower pot in the room.
2. Glue them on colorful construction paper to hang around the room.
3. Tape them together in a strip and hang them individually around the room.

The students can have fun naming their new flowers and telling the rest of the class about them.

After the flowers are displayed where everyone can see them, have the students walk around the room and look for similarities.

**How many people put the same combinations of flowers, leaves and roots together?**
Write that number on the board.

**How many different combinations do we have?**
Write that number on the board and make it a fraction using the total number of students in the class as the denominator.

Now, let’s see how many have the same combination of plant parts and colored them the same. **How many are exactly the same?**
They are probably almost all different in one way or another. As you can see, there are many different combinations in our class, just as there are thousands of different types of plants in the world.

Let’s learn the “Parts of a Plant” song that is written at the bottom of the Roots, Stems, Leaves and Flowers activity sheet. I think you will recognize the tune. The words will be easy to learn because you know about the four parts of plants.

Teach them the words to the “Parts of a Plant” song and sing it to the tune of “The Wheels on the Bus.” You may want to add movements similar to when they were seeds curled up in a chair. The roots were their legs reaching down toward the ground, the stem could be standing up, the leaves could be their arms reaching out and their hands wiggling, and the flowers could be their head moving back and forth.

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**EDIBLE PARTS OF PLANTS**

What were the four parts of plants we learned about?
Make four columns on the board with these headings: flowers, leaves, stems and roots.

Stand up if you think you eat flowers, leaves, stems and roots. What do you eat that are parts of plants?
(Have them guess, apples, bananas, lettuce, tomatoes, pizza, spaghetti, etc., and then have everyone sit down.)

Stand up if you eat fruits and vegetables. What are some examples of fruits and vegetables that you eat?
(Have them name fruits and vegetables that they eat. Remind them that they can be fresh, frozen, canned, dried, or as juice.)
Where do fruits and vegetables come from?
All fruits and vegetables come from plants. When we eat healthy fruits and vegetables, we are eating different plant parts. Let’s see if we can determine which part of the plant we are eating when we eat fruits and vegetables.

We are going to pretend we are a vegetable garden containing lots of different crops. (Give each student a Vegetable Garden Card found at the end of this lesson. Have them stand up and hold their card up in the air.)

We are going to group ourselves into the four different parts of a plant that you see listed on the board – flowers, leaves, stems and roots. If you are not sure what part of the plant is pictured on your card, I have a hint – peppers, tomatoes, pumpkins and peas start as flowers; after the flowers fade, these edible parts of plants form. (You may want to show a dried sunflower head or other faded flower that has formed seeds.) Now, find others in the class that have a picture of a fruit or vegetable that is from the same plant part as yours. Stand together in your plant part group. (Proceed to the Reflect section.)

Have the students remain standing in their plant part groups as you proceed with the following discussion.

Let’s see if our vegetable garden has been planted according to the parts of plants that we eat.

Which group of plant parts is the largest?
The flower plant part group is the largest because many of our fruits and vegetables produce flowers that become fruits.

What are the names of the vegetables growing in this group?
Have students from other groups identify each vegetable by looking at the pictures that the students are holding from that group. This group should include sunflowers, tomatoes, peppers, peas, cucumbers, pumpkins, broccoli, cauliflower, and corn. If they are in the wrong group, they should go to the correct plant part group. Write the names of the vegetables in the “flower” column on the board. You may want the students to take turns writing the names on the board by copying the word from the card.

Which of these crops is actually the flower of the plant?
We actually eat the flower buds of a broccoli plant. If we left broccoli on the plant to grow a few more days, the buds would open into yellow flowers. We also eat the flower head of a cauliflower just before the flower opens.

Raise your hand if you think tomatoes, peppers, pumpkins, squash, cucumbers, and beans are vegetables.
Raise your hand if you think tomatoes, peppers, pumpkins, squash, cucumbers, and beans are fruits.
You are all right – they are both! These crops come from flowers so they are classified as a fruit product on a plant. However, the edible classification of these less sweet crops makes them vegetables because we eat them as a main part or side dish of a meal. (Add squash and beans in the “flower” column on the board.)
What are some sweet fruits that come from flowers?
Apples, oranges, pears, peaches, plums, cherries, strawberries, and raspberries are examples of fruit from a plant. We call them fruit when we eat them. Sweet fruits are referred to as fruit because we can eat them as a dessert or a sweet side dish to our meals.

What crops in the flower part of our vegetable garden are seeds that we eat?
Sunflower seeds, peas and corn are examples of seeds we eat that start with a flower.

What are some other seeds that we eat?
Peanuts, almonds, other nuts, sesame seeds, popcorn, soybean seeds, dried beans, and peas are examples of other seeds we eat. (Add these examples to the flower list on the board.)

What seeds are the main food for livestock animals such as cattle, pigs, sheep, chickens, and turkeys?
Corn, soybeans and oats are the main sources of livestock feed. So, if we eat meat, eggs, milk, cheese, and other animal products, we still depend on seeds.

How many edible plants do we have in the leaf part of the garden?
There should be six. Have the students identify the leaf crops on the cards. If lettuce, spinach, cabbage, parsley, onions, and celery are missing, find them and add them to the group.

Which leaf crops surprised you?
We sometimes eat the green leaves of green onions, but the bottom, or onion bulb, is actually layers of leaves that have swollen to form the bulb. Although it looks like a stem, a celery stalk that we eat is actually a part of the leaf called the “petiole.” It is the stem or bottom of the leaf that attaches to the stem. The stem of celery is the solid core that connects the petioles to the roots. (Write these crops in the “leaves” column. You may want the students to take turns writing the names on the board by copying the word from the card.)

How many crops do we have in the stem part of our edible vegetable garden?
Celery probably was originally in this group. Now the stem group should have two members – asparagus and potatoes.

Raise your hand if you have eaten asparagus.
(Have one of the students point to the part that we eat, the stem.) We harvest asparagus when the stems are short and tender. Potatoes (not sweet potatoes) are actually swollen stems that grow underground. If we look at the potato in the picture, it is covered with buds or “eyes” that can sprout into shoots. (Point at the buds on the potato picture. Write these crops in the “stems” column. You may want the students to take turns writing the names on the board by copying the word from the card.)

How many crops are left in the roots section of our vegetable garden?
Three

What are the names of these crops?
Carrots, radishes and sweet potatoes are examples of roots we eat. Sweet potatoes don’t have buds or eyes, but you can see roots growing out of them. (Write these crops in the “roots” column.)

How many edible crops do we have in our garden?
(Have each group say the number it has and write the numbers on the board. Add the numbers together to find the total.)
How many edible crops do we have listed on the board?
( Have four students go to the board and add up their columns. Have them write their totals in a column to be added by the group. )

Did the class vegetable garden have more or less edible crops than the lists on the board?
Less

Do you think that the total number of plant parts we eat is greater than the one on the board?
Yes.
Why?
Because we haven’t listed every edible plant part in the columns.

Now, we are going to form new groups – tops, middles and bottoms. Those in the “tops” group have a picture of a crop that grows on the top of the plant. Those in the “middle” group have a picture of a crop that grows in the middle of the plant. Those in the “bottoms” group have a picture of a crop that grows in the soil. If you can’t decide, I have another hint – some plants may not have a middle that’s easy to see, so you will probably be in the “tops” group.
(Have each group stand in different parts of the room.)
Did our groups change?
Yes.
Stay in your “tops,” “middles” and “bottoms” groups and gather around to listen to a story about how a smart rabbit tricked a lazy bear by selecting crops to grow by tops, middles and bottoms.

Read and show the pictures of Tops and Bottoms by Janet Stevens. Stop reading at the point where Hare promises Bear both the tops and bottoms.

What did Hare and his family grow that produced crops on the bottoms of the plants?
Carrots, radishes and beets
(Have the students that were in the “bottoms” group stand up.)
What other crops did we have in our classroom “vegetable garden” that are from the bottoms of the plants?
Potatoes, sweet potatoes and onions

What did Hare and his family grow that produced crops on the tops of the plant?
Lettuce, broccoli and celery
(Have the students that were in the “tops” group stand up.)
What other crops did we have in our classroom “vegetable garden” that are from the tops of the plants?
Spinach, cabbage, parsley, sunflowers, asparagus, broccoli, and cauliflower

What did Hare and his family grow that produced crops on the middle of the plants?
Corn
(Have the students that were in the “middle” group stand up.)
What other crops did we have in our classroom “vegetable garden” that are from the middle of the plants?
Tomatoes, peppers, cucumbers, pumpkins, and peas

What do you suppose Hare is going to give Bear when he promises him both tops and bottoms?
Make guesses and continue reading.
Hare gave Bear the tassels and the roots. What part of the corn plant is the tassel?
Tassels are one type of flower on corn plants; they are at the top of the plant. The ears of corn form in the middle of the plant from another type of flower.

Why didn’t Bear want the other parts?
They aren’t the parts that we eat. However, beets can be grown for both the tops and the bottoms. We eat small, tender beet leaves in salads, and later we eat the roots when they become large and round.

Was everybody happy at the end of the book?
Yes.
Why?
They all got the food they wanted from the garden. They probably felt better because they were getting exercise by working in their gardens and eating more vegetables, which are important for good health.

Possibly on another day, distribute the Edible Parts of Plants activity sheet.

What do you see on the activity sheet?
A sunflower and different fruits and vegetables

Look at the pictures of the garden crops. Count how many of the edible parts of plants you have eaten. Raise one finger for each of the different vegetables, fruits and seeds you have eaten. If you have eaten all of them, raise both hands high in the air – good for you! You have made some very healthy food choices!

Look at the Key on the bottom of the activity sheet and label the sunflower “f” for flower, “l” for leaves, and so on.

Only one of the foods on the left side of the page comes from a sunflower. What is that food?
Sunflower seeds

Draw a line from the sunflower seeds to the flower on the sunflower plant. Now, take what we have learned about fruits and vegetables and the parts of the plant they come from and draw a line from the other fruits, vegetables and seeds on the left side to the plant parts on the sunflower that they came from. Then take out your crayons or markers and color all of the pictures on the page.

Use the following Key to go over the answers with the students.

<table>
<thead>
<tr>
<th>ACTIVITY MATCHING KEY</th>
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<tbody>
<tr>
<td><strong>Roots</strong></td>
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<td><strong>Fruits</strong> that started as flowers</td>
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<tr>
<td><strong>Leaves</strong></td>
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<tr>
<td><strong>Stems</strong></td>
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<td><strong>Seeds</strong></td>
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</table>
Before these activities, wash and cut fruit and vegetable plant part samples and put them on a large tray. Prepare the dips for spooning out onto the students’ plates.

What fruits and vegetables have you eaten yesterday and today?
Have the students list what they ate under columns on the board labeled roots, stems, leaves and flowers. Explain that fruits and vegetables are important to our health because they contain important vitamins and minerals that can keep us healthy. They also contain fiber to help clean out our bodies. Eating a variety of vegetables and fruits of different colors is a healthy eating tip.

Have the students wash their hands in preparation to try some vegetables and fruits. Show students actual samples of roots – an entire carrot; stems – a celery stalk but remind them it is really a leaf stem; leaves – a lettuce leaf; and flowers – an entire apple or orange. Have them guess what they are and what part of a plant they come from. Give the students each a small paper plate and a napkin. Take the tray of fruits and vegetables to the students and encourage them to try at least two to three different fruits and vegetables. Offer some ranch dressing and some cream cheese mixed with brown sugar to use as dips. The dips may encourage them to try new vegetables and fruits. If choosing is difficult for your students, prepare sample plates for them.

While they are sampling, discuss and describe the differences in flavor, texture and color between the leaves, stems, fruits and vegetables.

Let’s take some of our favorite foods and see how many different plant parts are represented in each food.

Divide the class into four groups and assign each group one of the following foods. They should discuss what vegetables or fruits are in each and what plant part they come from. They may want to write or draw their results on the back of the Edible Parts of Plants activity sheet. Then have them report back to the class. You may want to write the ingredients on the board.

- **Pizza** – onions (leaves); tomatoes, peppers, olives (fruits); crust (wheat seeds)
- **Hamburger** – onion, lettuce (leaves); tomato, catsup (fruit); mustard (seeds); bun (wheat seeds, sesame seeds)
- **Vegetable soup** – onions, celery (leaves); potato (stem); tomatoes, pepper, peas, beans, okra (fruit); carrots (roots)
- **Spaghetti and sauce** – tomatoes, peppers (fruit); onions (leaves); pasta (wheat seeds)

Which of these foods would be the healthiest for you to eat and why?
Vegetable soup is the healthiest because it has the most plant ingredients and the largest variety of plant parts and colors.

Which of these foods has the least nutritious plant parts and why?
A hamburger has the least nutritious plant parts because there are only very small amounts of each plant part in toppings such as catsup.

Be sure to check out additional learning opportunities about plant parts in the Optional Activity Ideas found at the end of this lesson. You may also want to go to the Outdoor Classroom, “Salad Garden.”
OPTIONAL ACTIVITY IDEAS

PLANT PARTS by the Banana Slug String Band

Materials: Dirt Made My Lunch or Singing in Our Garden CD by the Banana Slug String Band
(found at bananaslugstringband.com or through GITG staff development training)
CD player
Salad ingredients representing roots, stems, leaves, flowers, fruits and seeds
Salad dressing
Small paper cups
Plastic forks

While they are coloring the Edible Parts of Plants, you may want to play “Roots, Stems, Leaves” from the Dirt Made My Lunch or the Singing in Our Garden CD by the Banana Slug String Band. Remind the students to carefully listen to the lyrics. Play it a couple times so that they can understand the song. Then ask the following questions.

You may choose to play the song and ask the students to come up with motions to go along with the song.

What were the six parts of the plants in the song?
Flowers, fruits, seeds, stems, leaves, and roots

What part of the plant actually grows the fruit and the seeds?
Flowers

What do the roots do in the song?
They hold the plant in the ground and gather up water that falls around the plant.
What root did they say could be inside of you because you eat it?
Carrot

What does the stem do in the song?
They describe the stem like an elevator taking water up and sugar (plant food) back down.
What stem do they say could be inside of you because you eat it?
They identified celery as a stem, which most people do. It is actually the petiole that is like a leaf stem holding the leaf to the stem of the plant.

What are leaves doing in the song?
The leaves are the kitchens where air, sun and water are mixed together (during photosynthesis) to make plant food.
What leaf do they say could be inside of you because you eat it?
Lettuce

What are flowers doing in the song?
The flowers are dressed colorfully, and they hold pollen to attract bees. The bees carry the pollen from flower to flower so that the plant can produce fruits and seeds. The flowers also contain nectar for the bees to eat and take back to their hives to make honey.
What flower do they say could be inside of you because you eat it?
Cauliflower

What are seeds doing in the song?
They can be buried in the ground to start the cycle over again.
What seed do they say could be inside of you because you eat it?
Sunflower seed

Name some fruits that could be inside of you because you eat them.
Remember the definition of fruits and vegetables from the Reflect section of this lesson.

What ingredients of a garden salad are roots, stems, leaves, flowers, fruits, and seeds?
Have the students come up with salad ingredients representing all the parts of plants.
You may want to make a big garden salad including all the parts. Serve samples in small cups. If desired, squeeze a little dressing on the salad.

Materials: Stone Soup by Marcia Brown

We are going to read a story, Stone Soup. Pay attention because if you have the vegetable card with that vegetable, you need to stand up and bring it to the front of the room, then go back to your seat. If it is a root crop, put it on the same pile as other root crops. If it is a leaf crop, put it on the same pile as other leaf crops.

How many different plant parts were included in the soup?
Count the number of vegetable cards in each pile.

What other vegetables from our classroom vegetable garden could have gone into that soup?
Bring them to the front of the room and put them on the appropriate plant part pile.

Raise your hand if you think the soup probably tasted better at the end of the story than at the beginning.

Learn the parts of plants in a language other than English. An interpreter such as a parent or student can help the class learn the words. You could also go to the Growing in the Garden website lesson page and link to an archived lesson that lists the parts of a plant in Spanish and Bosnian. http://www/extension.iastate.edu/GrowingintheGarden/lessons_first.html

Resources

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<thead>
<tr>
<th>Carrot</th>
<th>Potato</th>
<th>Onion</th>
<th>Sweet Potato</th>
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<tr>
<td>Radish</td>
<td>Asparagus</td>
<td>Pea Pod</td>
<td>Corn</td>
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<tr>
<td>Tomato</td>
<td>Pepper</td>
<td>Sunflower</td>
<td>Lettuce</td>
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<td>Cabbage</td>
<td>Celery</td>
<td>Spinach</td>
<td>Pumpkin</td>
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<tr>
<td>Parsley</td>
<td>Broccoli</td>
<td>Cauliflower</td>
<td>Cucumber</td>
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