Lesson One: How does food relate to plants?

“Plant Parts Become Me” from GROWING IN THE GARDEN, Iowa State University Extension and Outreach

Students start out as seeds curled up in the soil waiting for water so that they can sprout roots, stems, leaves, and flowers. Through songs, actions, and fruit and vegetable identification and tasting, students will be able to tell everyone what parts of plants they are eating. To add to the fun and the reading component, please find a copy of Tops and Bottoms by Janet Stevens. The sleepy ol’ bear learns parts of plants from the industrious hare…the hard way.

Content objectives: Identify the basic and edible parts of plants and their functions. Make connections between plants and food choices.

Life Skill objectives: Healthy living; Critical thinking; Learning to learn; Communication; Citizenship; Leadership

Core and STEM concepts and skills:
Science Life science, Science in personal and social perspectives
Math Number and operations, Algebra, Data analysis and probability
Language Arts Vocabulary, Reading, Factual understanding
Social Studies Individual development and identity; Production, distribution and consumption; Individuals, groups and institutions; People, places and the environment

Healthy snack: Plant parts

Additional and supporting resources:
Singing in Our Garden (CD), “Plant Parts” by the Banana Slug String Band from bananaslugstringband.com
BEFORE THE LESSON

1. **Grade 2, Lesson 1:**
   This document contains all the curriculum items and resources you need for this lesson. All lesson downloads are located on the [www.peoplesgarden.wsu.edu](http://www.peoplesgarden.wsu.edu) Educational Toolkit.

2. Secure a copy of *Singing in Our Garden* (CD), “Plant Parts” by the Banana Slug String Band from [www.bananaslugstringband.com](http://www.bananaslugstringband.com)

3. Plant Parts Taste Testing
   Select at least four fruits or vegetables for each student to sample that represent roots, stems, leaves, and flowers. Wash and cut the samples and store them in separate bags in a cooler or refrigerator until this lesson. Keep one example of each of the vegetables intact so that students can see what it looks like.
   Examples include:
   - Roots – carrots, radishes
   - Stems – celery, chives
   - Leaves – lettuce, spinach;
   - Flowers or from flowers – broccoli, cauliflower, chive flowers

   Consider serving a simple dipping dressing, such as a choice of dressings like Ranch or Thousand Island.

THE LESSON

1. **Plant Parts Become Me** has optional activities that can be completed on different days.

AFTER THE LESSON

No additional activities recommended after this lesson.
### Plant Parts

**Become Me!**

**REvised**

**LESSON 2**

<table>
<thead>
<tr>
<th>CONTENT OBJECTIVES</th>
<th>Identify the basic and edible parts of plants and their functions, Make connections between plants and personal food choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIFE SKILL OBJECTIVES</td>
<td>Critical thinking; Communicating by singing, group work, and responding to questions and instructions; Learning to learn; Cooperation; Healthy lifestyle choices</td>
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<tr>
<td>INDICATORS</td>
<td>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</td>
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<tr>
<td>EVALUATIONS</td>
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<tr>
<td>SUBJECT STANDARDS</td>
<td><strong>Science:</strong> Life (characteristics of organisms), Science in personal and social perspectives (personal health, types of resources) <strong>Language Arts:</strong> Vocabulary, Reading, Factual understanding, Main idea, Interpreting, Inferring, Sequencing, Summarizing, Character development <strong>Math:</strong> Number and operations, Algebra, Data analysis and probability <strong>Social Studies:</strong> Individual development and identity; Production, distribution and consumption; Individuals, groups and institutions; People, places and the environment</td>
</tr>
<tr>
<td>LEARNER TYPES</td>
<td>Linguistic-words, Logical-mathematical, Spatial-visual, Music, Bodily-kinesthetic, Interpersonal, Intrapersonal, Natural</td>
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</tbody>
</table>
| MATERIALS | *Singing in Our Garden* CD by the Banana Slug String Band *(optional, see Introduction section, go to [www.bananaslugstringband.com](http://www.bananaslugstringband.com) for ordering information)*  
*Tops and Bottoms* by Janet Stevens  
Vegetable cards *(copy and cut one card per student, found at the end of this lesson)*  
Samples of fruits and vegetables that represent different plant parts *(examples include: roots – carrots, radishes; stem – celery; leaves – lettuce, spinach; flowers or from flowers – broccoli or cauliflower, snow peas, peppers, popcorn; see TEACHER’S NOTE at the beginning of the Apply section)*  
MATERIALS continued on next page
**MATERIALS continued**
- Squeeze bottle of Ranch™ dressing
- Small paper plates *(one per student)*
- Napkins *(one per student)*
- Edible Parts of Plants activity sheet *(one per student or one to do together, found at the end of this lesson)*

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**INTRODUCTION**

**ENGAGE**

**SET THE STAGE**

5 MINUTES

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**LIFE SCIENCE:**

Characteristics of organisms

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**TEACHER’S NOTES:** *This lesson is fun to do inside or outside.*

Let’s pretend that it is spring and we are seeds that have been planted in the ground. Curl up on the floor (or on the seats of your chairs) like seeds planted in the ground. The soil is all around you.

What do you need to start growing?
Water. I am going to float around the room like a cloud raining upon the ground or a watering hose or watering can sprinkling water over the soil and trickling down to you, the seeds. Your seed coats are starting to soften so your plants can start to grow.

What part of your body can you use to become roots?
Stretch out your feet and legs like they are roots growing out of the seed and pushing down into the soil. Roots hold plants to the ground just like your feet and legs that hold you to the ground when you are standing.

What part of your body is the stem pushing its way up and out of the soil?
Your body is the stem. Wiggle your bottom, shoulders and elbows. Pop up you head and start growing straight up above the soil.

Now what does your plant need to keep growing?
Sun, water and air. I am pretending to be the sun. *(Use your arms to make a circle above your head.)*

We have roots and stems, 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. Stretch your arms out like branches 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. The plant’s food is made in the leaves and the ingredients include energy from the sun, water, and air.

What part of the plant grows next?
The flower. Stand up straight with your head held high and smile because your head is a beautiful flower on top of a sturdy stem. Move your flower back and forth like it is enjoying the sunshine and the breeze. Flowers make it possible for plants to produce fruits, vegetables and seeds. All you need are some bees, butterflies, other critters or the breeze to pollinate your flowers.
Shout out the four basic parts of plants.
Roots, stems, leaves, and flowers

You may want to play the “Roots, Stems, Leaves” song from Singing in Our Garden by the Banana Slug String Band.

What happens to many plants after they have produced roots, stems, leaves, flowers, fruits, and seeds?
They either die or go dormant and rest awhile. So you can pretend to do either and sit back down on your roots or bottoms. We are going to call sitting on your roots, “plant basics”.

If you were a fruit tree or plant, what kind of fruit would you want to produce?
Apples, pears, cherries, plums, peaches, lemons, limes, oranges, grapefruit, bananas, kiwi, strawberries, raspberries, blackberries, grapes, watermelon, musk melon, etc.

If you were a vegetable plant, what kind of vegetables would you want to produce?
Cucumbers, tomatoes, peppers, broccoli, carrots, cauliflower, corn, peas, beans, okra, radishes, beets, onions, potatoes, sweet potatoes, eggplant, brussel sprouts, lettuce, etc.

Have the students gather where you read.

Raise your branches and leaves if you know the “Head, Shoulders, Knees and Toes” song.

Since you are pretending to be plants, we are going to change the body parts to plant parts and sing the song as “Flowers, Leaves, Stems and Roots.” Stand up and let’s figure out the song together.

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.
Practice your plant basics by sitting on your roots. We are going to read a story titled *Tops & Bottoms* written and illustrated by Janet Stevens.

*Show the way the book opens and has a top and a bottom. Go to the inside title page and look at the illustration of garden plants. Have the students identify the crops and do a thumbs up if they would eat the tops of the plant (flowers), thumbs down for the bottom of the plant (roots), and thumbs to the side if they would eat the middle of the plant (leaves and stems).*

*Show the illustrations and read the book. Stop and make predictions what Hare will grow the second time when Bear wanted the bottoms. Do the same when Bear wanted both the tops and the bottoms and Hare settled for the middles.*

**What three steps did Hare and his family do every time they gardened?**
They planted, watered and weeded.

**Was Hare making a fair deal with Bear? Why or why not?**
Hare and his family worked very hard on the garden while Bear slept. However, the garden was on Bear’s land. Hare was tricking Bear by choosing crops that would benefit his family but not Bear. Being tricked three times made Bear stop sleeping and start using his own land to exercise and grow healthy food through gardening.

Many landowners make arrangements with farmers to grow crops on their land. The farmers either pay rent or share the harvested crops with the landowners. That arrangement seems more fair than the one Hare made.

**Was everybody happy at the end of the book? Why?**
Eventually, they all got the food they wanted from the garden. They probably were healthier from all the outdoor exercising and eating healthy foods.

*Use the illustrations on the inside front or inside back cover to check for understanding. Point to each picture and have the students identify it and then do thumbs up for edible tops, thumbs down for edible roots, and thumbs pointed to the sides for edible middles.*

*Talk about what tops, middles and bottoms they might like to grow from the book and where a similar garden could be located near where they live and go to school.*
Distribute one vegetable card to each student, found at the end of this lesson. If you have time, they can use colored pencils or crayons to color their vegetable according to what color they think it is when it is ripe or ready to eat. Have them hold up their cards so others can see them. Ask them to tell what vegetable is on their card. If they don’t know, have the other students help them out. After everyone is finished, have them put down their cards. Proceed with the following strategy to group them as plant parts.

What part of the plant is the bottom part?
Roots

Where do roots grow?
Under the soil

What root crops did Hare plant?
Carrots, beets, and radishes
If you think you have a vegetable that is a root we eat, hold up your card.
Have the students sitting nearby look at the picture and confirm that the crop is a root or tell the student why they don’t think it is a root crop.

Did anyone hold up an onion as a root crop?
Onions grow just below the surface of the ground like many root crops but think about the layers on the onion. The layers of the onion are actually leaves that have swollen to form a bulb. So onions would be in the group with edible leaves.

Did anyone hold up a potato?
Potatoes are actually underground stems. Potatoes are covered with buds or eyes that can sprout into shoots or new potato plants. We can cut up a potato and start growing a new one from the buds. Sweet potatoes don’t have buds or eyes so they are still a root crop. So a potato would be in the group with edible stems.

Have all the students with root crops stand at one end of a larger open space, or a pretend garden space.

What part of the plant holds all the other parts together?
Stem

What vegetable did Hare plant that grows stems in the middle part of the plant that we eat?
Celery
If you think you have a vegetable that is a stem we eat, hold up your card.
Celery, asparagus and potatoes (remember potatoes are underground stems with buds or eyes) are the primary examples of the stem vegetables we eat. The stalk of the celery is actually called a “petiole” or the leaf stem that attaches to the real stem, which is the solid core that attaches all the celery stalks to the roots. However, we will still refer to celery as a stem. You can also eat the celery leaves.

Have the students with the stem crops stand in a separate group near the root crops.

What part of the plant grows next?
Leaves

What vegetable did Hare plant that grows leaves on the top part of the plant that we eat?
Lettuce
If you think you have a vegetable that has leaves that we eat, hold up your card.

Have the students sitting nearby look at the pictures and confirm that the crop is a leaf or tell the student why they don’t think it is a leaf. Students may not view parsley as a vegetable and they may need to be reminded that the layers on the onions are actually leaves.

Have the students with the edible leaf crops stand on either side of the stem crops.

There are four basic part of a plant. What is the fourth part?
Flowers

Did Hare grow any flowers?
The book didn’t say that he did. But many of the vegetable plants he grew had flowers before the plants could grow fruit with seeds in them. Many of those fruits we call vegetables because they aren’t usually a dessert item or a sweet treat.

What vegetables are left that look like we eat flowers or that have the word “flower” in their names?
Hold up the picture if you think you have these.
Broccoli, cauliflower, sunflower

What vegetables are left that have seeds in them?
Hold up the picture if you think you have these.
Cucumber, pumpkin, pepper, tomato, corn, and pea pods

What part of the plant had to be present before these vegetables could grow?
Flowers. The flowers had to be pollinated by bees, butterflies, other critters or the breeze before the plants could produce these vegetables that contain seeds.

Everyone with cards that look like flowers or that came from flowers stand together in the flower group on the opposite side of the roots. Our vegetable garden should now be organized in roots, stems, leaves and flowers.

Use the Vegetable Card Key and visit the groups one by one to be sure that everyone is in the right group.

**VEGETABLE CARD KEY**

<table>
<thead>
<tr>
<th>Plant Part</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roots</td>
<td>carrot, sweet potato, radish, beets</td>
</tr>
<tr>
<td>Stems</td>
<td>potato (underground stem with buds), asparagus, celery</td>
</tr>
<tr>
<td>Leaves</td>
<td>onion (layers are leaves), lettuce, cabbage, spinach, parsley</td>
</tr>
<tr>
<td>Flowers</td>
<td>sunflower (eat the seeds in the middle of the flower), cauliflower, broccoli</td>
</tr>
<tr>
<td>Come from flowers</td>
<td>beets, pumpkin, tomato, pepper, pea pod, corn (the tassel is the flower)</td>
</tr>
</tbody>
</table>

Have everyone count together the number of vegetables in each group.

Which group is the largest?
Flowers

Which group is the smallest?
Stems

Have everyone put their cards down on the floor in the middle of their group. Ask them what their favorite vegetable is and have them move to that part of the plant. For example, if they
like corn best, they would move to where the flower pictures are laying on the floor. If their favorite vegetable is carrots, they would move to the root crop pictures. If they like pizza, spaghetti sauce, salsa, or ketchup that contains tomatoes and they didn’t have any other favorite vegetable, they would go to the flower pictures that include tomatoes. The same thing could apply to pickles made from cucumbers. Tell them not to discuss their favorites with anyone, just move there. (Otherwise, they tend to choose the same as someone else.)

Discuss the most and least popular plant part groups. Then have each of them tell which vegetable they liked best that attracted them to each of the groups they are in. If they ended up in the wrong plant part group, you may have to move them and see if that changed the most popular plant part.

**TEACHER’S NOTES:** Select at least four fruits or vegetables for each student to sample that represent roots, stems, leaves, and flowers. Keep one example of each of the vegetables intact so that students can see what it looks like. Wash and cut the samples and store them in separate bags in a cooler or refrigerator until this lesson. Be prepared for dipping with a squeeze bottle of Ranch™ dressing.

Also select other roots, stems, leaves and flowers crops and display them on a platter along with the intact examples of the samples the students will eat. After you show and talk about the extra examples, you may choose to wash and cut them to sample, as well.

Before starting this Apply section, wash your hands and the surface of the serving table and have the students wash their hands. While they are doing that, put out enough small paper plates for each student and place one of each of the plant parts on each plate. Adult or student helpers make the work go faster. Have the helpers deliver the plates to the students. **Remind all the students not to eat anything until after you discover more about each sample.**

Use the tray of edible plant parts to proceed with the following activity.

**What is special about this tray of food?**
Possible answers include:
- It includes only fruits and vegetables.
- It has plant parts that we can eat.
- It is probably healthy because it includes lots of fruits and vegetables.
- It is very colorful.
- It has lots of shapes and sizes.
- It makes me hungry.
- It includes things that grow in gardens.
- I don’t know what all of the things are.

If you said that these fruits and vegetables are healthy, you were right.

**What is in fruits and vegetables that is so healthy?**
Fruits and vegetables contain vitamins and minerals.

Rise your hand if you have heard any of these sayings: “Carrots are good for your eyes.”
“An apple a day keeps the doctor away.” “Eat oranges to prevent a cold.”

**LIFE SCIENCE:** Characteristics of organisms

**SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES:**
Personal health, Types of resources

**SOCIAL STUDIES:**
Production, distribution and consumption; Individuals, groups and institutions; People, places and the environment

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Fruits and vegetables contain nutrients called vitamins and minerals that can help our eyes, skin and hair to sparkle and our bodies to fight off colds, flu, and other illnesses. They also contain fiber to help clean out our bodies.

If you noticed that the fruits and vegetables were colorful and come in many shapes and sizes, you discovered a healthy tip. We are suppose to “vary our veggies” meaning that we should eat a variety of colors and kinds of fruits and vegetables. That means we are getting several different kinds of good vitamins and minerals.

**Raise your hand if you eat a variety of fruits and vegetables throughout the week.**

**How about throughout one day?**

**What are some of your favorite colors of fruits and vegetables?**

Let’s see if you can identify each plant by its color, shape, and size. *(Go through each sample on the tray color by color and have students tell the color and the name of the fruit or vegetable. For example, start with the green fruits and vegetables and have them identify each of them such as lettuce, peas, broccoli and so on.)*

Before we identify the plant parts on the big tray of fruits and vegetables, guess what plant parts you have on your plate. Find the root sample and put it on the part of the plate where you would find roots. Then decide what other plant parts you have and arrange them where you would find them on a plant. After you are done, you will have designed a new, totally edible plant. Think about what you would name your new plant. *(Give them a minute or so to arrange their plant.)*

Go through the fruits and vegetables on the tray, one at a time, and have the students determine whether they are roots, stems, leaves, flowers or they come from a flower. Remind them of the following:

- Potatoes are really underground stems because of the buds or eyes, but sweet potatoes don’t have buds or eyes so they are roots.
- Celery is really a leaf stem and the real stem is the thick part connecting all the stalks of celery to the roots.
- An onion has many layers of leaves so it is really a leaf rather than a root, even if it grows underground.
- On some plants like asparagus and broccoli, we eat both the flowers and the stem.
- Vegetables that have seeds come from plants that have flowers first before they produce fruits and seeds. Fruits grow on plants, but we call some of them vegetables because they aren’t as sweet and we don’t usually eat them as desserts.

The students can taste one bite of their root, stem, leaf, and flower sample as it is discussed. After all the fruits and vegetables have been discussed, the students can finish eating their fruit or vegetable. Go around with the squeeze bottle of dressing for dipping, if they request it.

Distribute the Edible Parts of Plants activity sheet or make a large image of it on the wall or screen, found at the end of this lesson. Have the students label the sunflower verbally or on the blank lines. Have students take turns to come up and point to the edible plants on the left and make a line with their finger or a pointer to the part of the plant it comes from. For example, point to the radish and draw a line to the root of the sunflower. Remember that fruits and seeds come from a flower.
**Optional Activity Idea**

**MY TOTALLY TASTY PLANT**

Have the students fold a blank sheet of paper into thirds, hamburger style. Looking at the bottom third of the paper, draw a line to represent soil near the fold or the top of that section. Have them draw a root that they can eat below the soil line on the bottom third of the paper. After they are done, have them start to draw the stems up over the fold to the middle part of the paper. Then have them open up the middle section so they just see that section and not the top or bottom. Have them pass the paper to someone else. The next student should not look at the bottom or root part of the picture. It will be a surprise.

In the middle section, have the students draw edible stems or leaves. When they are done, have them draw a stem line up into the top third of the paper, turn the paper so the next students will only see the top third, and pass it on. Remind the next students to not look at the middle or bottom part of the picture.

In the top section, have the students draw edible flowers or a fruit or vegetable that comes from a flower (and has seeds inside or out). When they are done, have them toss their papers like pollen or seeds in the air that float to the ground where they may be planted in the soil. Have the students pretend to be watering cans and water the seeds, the sun to give them energy to grow, and blow on them to give them air.

Then have the students, or gardeners, harvest or pick up the papers, open them up and find the new totally tasty plant. Students can share what is on their plant and then you can collect them to display on a wall garden.
carrot  potato  onion  sweet potato  
radish  asparagus  pea pod  corn  
tomato  pepper  sunflower  leaf lettuce  
cabbage  celery  spinach  pumpkin  
cucumber  broccoli  cauliflower  parsley
<table>
<thead>
<tr>
<th>Edible Parts of Plants</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>radish</td>
<td></td>
</tr>
<tr>
<td>carrot</td>
<td></td>
</tr>
<tr>
<td>sunflower seeds</td>
<td></td>
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<tr>
<td>celery</td>
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<tr>
<td>tomato</td>
<td></td>
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<tr>
<td>corn kernels</td>
<td></td>
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<tr>
<td>lettuce</td>
<td></td>
</tr>
<tr>
<td>cucumber</td>
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**KEY:**
- f. flowers
- l. leaves
- r. roots
- s. stems