

SUPPLEMENTARY LESSON: EXTENSION OF FRUIT OR NOT?

# Classifying the Edible Parts of Plants

After completing the lesson “Fruit or Not?” (page 23) students will have been introduced to one of the six edible parts of plants. This lesson will build on that understanding as students explore the other five parts and their specific functions.

## SUBJECTS



SCIENCE



NUTRITION

**Aa**

LANGUAGE  
ARTS

## GRADE LEVEL

**3-5**

## TIME

**Day 1: 30 min    Day 2: 1½ hrs**

# Classifying the Edible Parts of Plants

Students will first learn about basic plant anatomy and learn a song. Then, they will visit four different hands-on stations set up around the classroom to further investigate the edible plant parts. Students will be split up into small groups (4-6 per group) and travel from station to station together. It may be helpful to have a teacher's aide or parent help facilitate the students at the different stations.

**Note:** This lesson is broken up into two days. Day one is “Plant Anatomy and Nutrition” and day two is the “Edible Station” activity. While flowers are one of the five remaining edible parts of a plant, they are not included as a separate station in this lesson. A thorough investigation requires more time than a station activity can allow. Flowers are explored in greater detail in a following lesson.

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## Objectives

- Students will know the six edible parts of plants and their functions
- Students will gain exposure to possibly new vegetables and fruits
- Students will explain the vitamins and minerals commonly found in different foods

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## Day 1

### Materials & Preparation

- Labeled diagram of a typical plant with six main parts labeled, for reference
- Song sheets of the song “Roots, Stems, and Leaves”

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## Day 2

### Materials & Preparation

- Station 1
    - Bunches of various greens (the leaves) cut into taste-size bites: examples include mustard, collards, lettuce, Swiss chard. If your school has a garden with some of these, take your class outside to harvest and wash the greens.
  - Station 2
    - Edible stems cut into taste-size bites: examples include celery stalks, a can of bamboo shoots and asparagus.
    - Celery stalks set aside (not for eating, one for each group)
    - Hand lenses (one for each student at the station)
    - Glass filled with water (one for each group)
    - Food coloring
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- Station 3
  - Edible roots samples cut into taste-size bites: examples include carrots, radishes, turnips, beets, sweet potatoes and parsnips
  - Whole edible roots set aside (not for eating, one for each group)
  - Picture of a whole tomato plant with root system, labeled fibrous roots
  - Picture of a whole potato plant, labeled tuberous roots
  - Picture of a whole onion plant, labeled adventitious roots
  - For an optional extension activity on root sprouting: shallow dish with water, one for each group
- Station 4
  - Variety of seeds: for example, various vegetable seeds, sunflower seeds, dried beans
  - Dry lima beans or kidney beans, soaked overnight (two per student; one for dissection and one for sprouting)
  - Hand lenses (one for each student at the station)
  - Labeled diagram of a dissected lima bean
  - Pair of tweezers
  - For an optional extension activity on seed germination:
    - Petri Dishes (one for each group)
    - A few paper towels
    - Index cards (one for each group)
- Station Preparation:
  - Write up station instruction sheets for students, one per student,
  - Create a Student Observation Log, one per student, or have students record in their journals.
  - Set up the stations the day before the activity. You might need to move desks or tables to create the four separate stations around the room and label them “Station 1: Leaves”, “Station 2: Stems”, etc.

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## Common Core Standards

- SL.3.1., 4.1, 5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade appropriate topics and texts, building on others' ideas and expressing their own clearly.
- W.3.2., 4.2, 5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- 3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

## Day 1

### Lesson Introduction

1. Explain to students that they are now going to learn about the different edible parts of plants. If your class has completed the "Fruit or Not?" lesson, connect this lesson to it.

## Day 1

### Body of Lesson

2. Walk through the edible plant parts (roots, stems, leaves, flowers, fruits, seeds) and their functions with students. Draw a labeled picture of a plant on the board (students can copy this in their journals and color later or for homework).
  - Have a class discussion about the functions of each part on the blackboard. For example, lead with questions like: What do these parts do for the plant? How do plants capture sunlight? How do nutrients travel in plants? Can a stem be big (like a tree trunk)?
3. Explain to students that some of the six types of edible plant parts tend to be especially rich in nutrients. For example, leafy green vegetables are high in vitamins A and C, iron, and potassium. Seeds like pumpkin seeds, sunflower seeds and beans tend to be high in protein and other nutrients.
4. To further students' understanding of the parts and the different functions, you can teach the song, "Roots, Stems, and Leaves" by the Banana Slug String Band. (See following page).

# Classifying the Edible Parts of Plants

## Day 1

### Lesson Introduction

1. Explain to students that they will be traveling around to the different stations around the room and exploring four of the six plant parts in greater detail. Stations should take about 20-25 minutes each. Remind them to read station instructions carefully.

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## Day 2

### Body of Lesson

2. Station 1: Leaves
  - Give each student a taste-size portion of each type of leaf. On their Observation worksheet or journal, ask them to write down their observations about each leaf (color, shape, texture, smell, and finally taste).
  - Have them make a hypothesis about which leaf will be the class favorite and write it down.
  - Once each student has tried each leaf, have them tally their small groups' favorites. After the activity, the class will combine the tallies to come up with a class favorite and make a bar graph describing the class results.
3. Station 2: Stems
  - Give each student a plate with each type of stem. On their Observation worksheet or journal, ask them to write down their observations about each leaf (color, shape, texture, smell, and finally taste).
  - Have each student cut or break open the celery stalk and observe the stringy tubes that carry water and liquids to the rest of the plant. Use magnifying lenses for close observation. Have students draw what they see.
  - Next have each group of students decide on a food coloring to add to their glass of water, and place celery stalk in it. Have students write down their hypotheses about what will happen when they check on their celery tomorrow.
4. Station 3: Roots
  - Give each student a plate with each type of edible root. A whole edible root should also be on the table for study. On their Observation worksheet or journal, ask them to write down their observations about the whole edible root and each root sample (color, shape, texture, smell, and finally taste).

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- Ask them to compare and contrast the root on the table (a taproot) with the pictures of other types of roots on the table:
- Fibrous roots - picture of tomato plant
- Adventitious roots - roots that grow directly from stems, leaves, branches, or bulb
- Tuberous roots - roots that have starch and sugar storage units at the end
- Optional extension: For each group, help them cut off the top portion of their root, leaving about ½ inch of vegetable. Place the top portion in a shallow dish of water until it begins to sprout. Have student measure the sprouts' growth daily.

## 5. Station 4: Seeds

- Give each student a plate with a lima/kidney bean that had been previously soaking.
- Ask students to carefully remove the seed coat with tweezers and draw and identify the seed parts based on the provided diagram: seed coat, embryo and cotyledons. Ask them to make educated guesses about the functions of each part.
- Optional extension: Next, have students germinate or sprout the additional soaked lima/kidney beans. For each group, one student will need to cut out a circular piece of paper towel to line the bottom of the petri dish with. This will be the germination chamber. Another student should dampen the paper towel with water. Students should place the lima beans on the paper towels and distribute their seeds on it. Mark on the index card, which seed belongs to which student. Place petri dish by window and regularly observe and note growth over the week. Students can draw stages of germination, and after a week or two, plant them in soil to observe development of the plant.

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## Conclusion

Come back together as a class and share:

1. Combine tallies of leaves and have students complete a bar graph of results.
2. Discuss hypotheses about the celery and food coloring.
3. Review different root structures and hypotheses about the root sprouting activity if completed.
4. Review different parts of the seed and hypotheses about the seed germination activity if completed.

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## "Roots, Stems, and Leaves"

by the Banana Slug String Band

### Chorus:

**Roots, stems, leaves, flowers, fruits and seeds**

**That's six parts, six parts, six plant parts that people need.**

The roots hold the plant in the ground

They gather up the water that falls around

And there's a root inside of me

Because a carrot is a root that I eat

That's six parts, six parts, six plant parts that people need

A stem is an elevator growing up from the ground

The water goes up and the sugar back down

And there's a stem inside of me

Because celery is a stem that I eat

The leaves are the kitchens where the food is done

They breathe the air and catch rays from the sun

And there's a leaf inside of me

Because lettuce is a leaf that I eat

### Chorus

The flowers are dressed so colorfully

They hold the pollen and attract the bees

And there's a flower inside of me

Because cauliflower is a flower I eat

The fruit gets ripe, then falls on down

It hold the seeds and feeds the ground

And there's a fruit inside of me

Because an apple is a fruit that I eat

### Chorus

The seeds get buried in the earth

And the cycle starts again with a new plant's birth

And there are seed inside of me

Because sunflower is a seed that I eat

Now you know what this whole world needs

It's roots, stems, leaves, flowers, fruits and seeds

There's six plant parts inside of me

Because a garden salad is what I eat