Lesson Plan Title: Phenomenal Plant Parts
Grade Level: 3
Content Area: Science
Setting: School garden, or classroom
Instructional Time: 60 to 90 minutes

Grade Level Expectations: Life Science
- L.O.L.E3: Structures and Functions—Organisms have different structures that serve different functions in growth, survival, and reproduction.
- O3.31: Describe the function of the following plant parts: flower, stem, root, and leaf.
- 3.41: Classify plants on the basis of observable characteristics (roots, leaves, stems, and flowers).

3MNN Behavioral Outcomes
- Eat fruits and veggies, etc.

SNAP-Education Nutrition Messages
Eat fruits and veggies as healthy snacks, MyPyramid servings

Goal
Students will explore the different types of plant parts and their functions by comparing and contrasting a variety of nutritious foods. Students will observe a variety of plants and classify the parts and their functions in a number of ways, both as individuals and in collaboration with their peers.

Learning Objectives
Students will observe and classify different plants parts and their functions (roots, stems, leaves and flowers). Students will identify and discuss different plant parts as nutritious snacks.

Background
Plants have five distinct parts, each with its own function:

- Roots, which are almost always underground, help to anchor the plants. They are also essential for absorbing water and nutrients from the soil. Finally roots also often serve as a place for the plant to store carbohydrates. For example, carrots and beets are two plants that store ‘food’ (carbohydrates) underground.

- Stems provide support for the plant, as well as transport water and nutrients taken in by the roots up to the leaves. Food (carbohydrates) produced by the leaves moves to other parts of the plant through the stem.

- The primary job of leaves is to absorb sunlight and manufacture food (carbohydrates) for the plant. During this process, called photosynthesis, leaves take in carbon dioxide and release oxygen (a byproduct which benefits living things that need oxygen!).

- Flowers are responsible for sexual reproduction. Flowers are often showy and come in many different colors, shapes, and even with different smells. Pollinators (especially insects) are attracted to certain flowers, often feeding on nectar. In exchange, they help pollinate the flower. Further:

- Once a flower has been fertilized, it will produce a fruit (or ripened ovary) containing seeds. Many fruits contain food, and attract animals – which often help spread the seeds around when they feed on them. Seeds are tiny plant embryos – that will grow into new plants once they have the right conditions to begin growing.

Vocabulary
Roots
Stem
Advance Preparation

- Slice up sample vegetables and fruits for taste testing.

Supplies for Each Group

Common vegetables to represent each plant part.
- Root – carrot (use a full carrot with the green “top”), beet, turnip
- Stem – celery
- Leaf – lettuce,
- Flower – broccoli, cauliflower, artichoke
- Fruit – apple, grape etc.

An “example” plant growing in soil (in a pot, outside, etc.) If the example plant does not have fruit or flowers, add paper ones. (Supply these)

Butcher paper and markers if working outside, chalkboard or chalk/whiteboard if inside.

Safety Notes

Wash hands before sampling foods.

Procedures

1. Introduction: Break students into groups and provide each group with one sample vegetable (a carrot, a celery stalk, etc.). If a school garden is available, do this part of the lesson outside. If not, students can work at their desks or tables. Provide the students with a graphic organizer to record their observations. (KWL chart) (Supply KWL chart)

2. Tell the students that they are going to be scientists and observe the specimen in from of them. Explain that it may seem like an ordinary item at first, but they should pause, and closely and carefully observe the item. What do they notice? Instruct them to take 10 minutes to fill in the “Know” and “Want to Know” portion of their graphic organizer in writing. (Lower level students can draw pictures instead). Remind them to keep the “Learned” portion blank as they will fill it in later.

3. Have volunteers from each group share their Know and Want to Know about their plant part with their group. Let them choose as a group which graphic organizer they would like to share with the whole class, one per group.

4. Have one student from each group read their Know and Want to Know aloud. Watch for words that relate to health, food and plant parts. (Delicious, root, vitamins, leafy, etc.) After each read aloud, praise the student and write key words in a chart on the board (if inside) or on butcher paper (if outside) pointing out some the terms the students described.

For example:

<table>
<thead>
<tr>
<th>Carrot</th>
<th>Celery</th>
<th>Lettuce</th>
<th>Flower</th>
<th>Bean</th>
</tr>
</thead>
<tbody>
<tr>
<td>good for eyesight, crunchy, sweet</td>
<td>healthy crunchy good snack, yummy with peanut butter</td>
<td>dark green/red color, salad</td>
<td>looks like a little tree, (broccoli), can be eaten cooked or raw</td>
<td>green or red, sometimes has seeds</td>
</tr>
</tbody>
</table>
5. Point out that these observations fall into two basic categories. Can the students tell based on the chart? Answer #1: they are all HEALTHY SNACKS. Ask students where the items fall into MyPyramid for Kids. Point out that beans fall into both the Meat and Beans Group, and the Vegetable Group. Answer #2: They are all examples of DIFFERENT PLANT PARTS.

6. Add a third category to the chart. This time ask the students if they can identify what part of the plant each healthy snack is? To help them visualize, use a new and full plant (just about any plant growing in the garden or plant plug will do, including a potted flower or houseplant in a pot that can demonstrate the different plant parts. If the plant doesn’t have flowers or fruit, add a fake one cut from paper or from a dollar store.) Walk the students through the process of comparing. Hold the stalk of celery next to the stem of the sample plant, if you can expose the roots of the plant, compare them to the carrot, etc. Add the plant parts to the chart.

<table>
<thead>
<tr>
<th>Carrot</th>
<th>Celery</th>
<th>Lettuce</th>
<th>Flower</th>
<th>Bean</th>
</tr>
</thead>
<tbody>
<tr>
<td>good for eyesight, crunchy, sweet</td>
<td>healthy crunchy good snack, yummy with peanut butter</td>
<td>dark green/red color, salad</td>
<td>broccoli</td>
<td>filling, canned, makes delicious tacos</td>
</tr>
<tr>
<td>root</td>
<td>stem</td>
<td>leaf</td>
<td>flower</td>
<td>fruit</td>
</tr>
</tbody>
</table>

7. Have students brainstorm other plant parts they eat. Add them as examples to the chart.

8. Ask students what they think the different plant parts do for the plant. Walk them through this hypothesizing process with hints. Water the plant and ask how the plant drinks (roots), how the plant reaches sunlight, etc. Add this information to the chart.

<table>
<thead>
<tr>
<th>Carrot</th>
<th>Celery</th>
<th>Grapes</th>
<th>Lettuce</th>
<th>Flower</th>
</tr>
</thead>
<tbody>
<tr>
<td>good for eyesight, crunchy, sweet</td>
<td>healthy crunchy good snack, yummy with peanut butter</td>
<td>filling, canned, makes delicious tacos</td>
<td>dark green/red color, salad</td>
<td>bright red (hibiscus) makes tea, tart and tangy</td>
</tr>
<tr>
<td>root</td>
<td>stalk</td>
<td>Grapes</td>
<td>leaf</td>
<td>flower</td>
</tr>
<tr>
<td>drinks water and nutrients anchors plant in ground, stores energy,</td>
<td>absorbs water</td>
<td>protects seed</td>
<td>makes food (photosynthesizes)</td>
<td>makes the seed</td>
</tr>
</tbody>
</table>

9. Reinforcement: Repeat the plant part identification of plant parts with other plants in the garden setting or with another sample plant in the classroom. Do this aloud with students. They have them work in pairs (or alone) to draw and label the plant parts of a plant of their choice in the garden of classroom. Be sure they add the function for each part.

9. Assessment. Have students complete the L portion of their KWL chart. While students are working taste test the example plant parts as a healthy snack for students to eat.

END

Expansion:
• Have students create a “wacky plant” including all 5 plant parts (so the plant can live of
course!). Imagine, what if the plant had a stem like celery, and a root like a carrot. What
a really healthy snack this would make! Have the students color and label the wacky
plant. Be sure the add the function for each plant part.

• Have students create a “Giant Wacky Plant” for the classroom wall or hallway using
butcher paper and markers. Break the students into 5 groups and assign them each a
plant part. Have them draw, color and cut out each plant part. Be sure they label the
plant part and briefly describe the function. Put all the parts together to create one big
wacky plant to serve as reinforcement on the wall of the classroom.

• Play the plant parts stem game: Have students stand in two lines on a flat surface.
Explain that one one line is the part of the stem that transports water up the stem. The
other line brings sugar back down. Using cups, do the relay. (Ask Jessica Albright for
directions.)

• Create a plant part cook book as a class. Have students bring in healthy recipes that
have a plant part as a main ingredient. Break students into 5 groups to design a page
that discusses one plant part and the function of that plant part. Each recipe should
include the name of the plant part that is being eaten, and the Food Group that it falls
into. Divide the cook book by plant part.

(Provide book template)

Index:

Plant Parts and Their Functions:
- Roots
- Stems
- Leaves
- Flowers
- Fruits

MyPyramid: The Food Groups & How Much We Should Eat In Each Group

Root Recipes
Stem Recipes
Leaf Recipes
Flower Recipes
Fruit Recipes

• Plant a “Plant Parts Garden” In the classroom or outside. Plant different plants that have
interesting, edible and showy plant parts. Roots – turnip, Shoots – curly willow (celery,
asparagus), Leaves (lettuce) etc.

• Taste test some more exotic edible plants available in major grocery stores. Examples
include cactus leaf, sugar cane stems, tamarind, star fruit, edamame (soybeans) bamboo
shoots (available canned), artichoke, squash flowers

• When cutting up the vegetables save seeds and distribute them to students who wish to
plant them to grow their own plants. Encourage them to do so. OR plant the seeds in
cups in the windowsill.

• Grow the tops of root vegetables in the windowsill or garden. Carrot tops, beets, or
turnips work well. (Provide directions)

Assessment
- KWL Chart

Student Page
KWL Chart

Visual Aid

Strategies for Below Level Readers
Flash cards for vocabulary
Have students draw pictures in their KWL chart rather than writing observations.

Strategies for Above Level Readers
Compare Jack and the Bean Stalk with Kate and the Bean Stalk (by Mary Pope Osborne)

Extension Ideas

Supporting Resources

Teacher Resources

Literature
Math in the Garden (White, Baritee, Kopp)

Websites
- squarefootgardening.com
- www.jmgkids.com

Interactive Technology Opportunities

Wonder wall

FUN FACT: Did you know? Banana “Trees” aren’t trees at all! They are plants with a very large and strong stem. We often confuse the large stem with the trunk of a tree. We eat the banana fruit, but the flower is also edible.