**Project/Lesson Plan**

**Yummy Plant Parts - Key Stage 2/3**

**Objectives**

Students will:

1. Understand the structure and function of roots, stems, and leaves.

2. Identify the parts of a plant by looking at an entire plant or a part of a plant.

3. Understand the importance of plants for animals' (humans') existence.

**Materials**  
For this lesson, you will need:

• Various market-fresh vegetables such as an uncut carrots, radishes, celery, broccoli, potatoes, sweet potatoes, spring onions, brussel sprouts, asparagus, leeks, ginger, lettuce, parsley

• Magnifying glass

• Paring knife

**Procedures**

1. Discuss with students the four organs that are found on plants: roots, stems, leaves, and flowers. Concentrating on roots, stems, and leaves, have students describe the structure and function of each organ. Be sure you describe both their external and internal structures. Depending on the level of the student's knowledge, actual plant tissue names can be discussed. Diagrams should be drawn or provided for students' use.

2. Have students pick a plant and brainstorm a unique characteristic or adaptation of each plant organ, based on its habitat. Have them think about all the habitats that plants live in, such as deciduous forest, desert, ocean, freshwater, tropical rain forest, tundra, or grasslands. Have students choose one plant and its habitat and develop an explanation as to why that plant is able to survive with a particular adaptation. Climbing roots, food storage roots and stems, tendrils in vines, and carnivorous plants could all be possible examples. Students should describe the relationships between each of the plant organs and the environment.

3. As a class or in small groups, have students observe, classify, and dissect a number of examples of plant organs that have been obtained from the supermarket. Students should observe each vegetable, describe both its external and internal structure in detail, determine what plant part the vegetable represents, and describe the plant function. If working as groups, students will need to present their knowledge to the entire class.

4. Along with providing students with some obvious examples of plant organs, students should also observe some adaptations of plant organs and be able to explain how that adaptation serves the plant. An example of this would be potatoes classified as stems.

5. Discuss with the students which plant parts were easy to identify and which were difficult. What vegetables contained more than one plant organ? Did any vegetable parts show a useful adaptation for the plant? What variations were found within the same plant organ?

**Extension**

Have students prepare thin tissue samples to study under a dissecting or compound microscope. Students should be able to identify tissue types that vary between the three vegetative organs of a plant (mesophyll, pith, cambium, xylem, and phloem).

**Discussion Questions**

1. What plant organ do you think you eat the most? Is it a root, stem, leaf, or flower?

2. Compare and contrast the structure and function of the vegetative plant organs studied. What structures were similar in each organ? What functions did they have in common? What characteristics of each organ could you easily identify when you studied the vegetables? What accounts for the differences in functions of different organs in the same plant? What do you think would happen to a plant's survivability if one or more of its organs changed—through genetic enhancement, for example?

3. After studying roots, stems, and leaves, discuss how each of these plant organs can adapt to different environments. Discuss examples of an adaptation for each organ.

4. Chose an extreme environment and find out what type of plants live there. What features do the plant organs have that enable them to survive in a swamp, river, desert, or ice cap?

5. Debate whether humans should genetically alter crops and the vegetables that are harvested. Should the United Kingdom import and export these crops?

6. Are certain plants endangered in your area? Why do endangered animals receive more support and press than endangered plants? Should they?

7. Discuss how plants can help society and the world. What are some uses other than food for plant organs? Provide as many examples as possible.

**Evaluation**

 
Have students present what they've learned in oral presentations, posters, computer visual presentations, models, or even as games. Students should be evaluated on the accuracy of the scientific information they present; whether they have included accurately detailed diagrams; their ability to show an understanding of a plant organ's function; and an understanding of how a plant organ relates to the other parts of the plant.

**Extensions**  
Tree Rings
Obtain cuts from a tree or from various trees (e.g., firewood) to study the annual ring patterns. Where are the rings close together? Are there any scars in the rings? Can you hypothesize why the scars were made? What environmental conditions and changes can be interpreted using tree rings (climate, pollution, etc.)? Calculate how old the trees were.

Simple Seed Experiment
Plant four seeds facing different directions in a clear container (petri dish, glass) near a light source. Each seed should be planted right side up, root facing down. The four seeds should be facing north, south, east, and west, respectively. Support the seeds with filter paper, paper towel, or cotton balls, and water the seeds well. Observe the seed growth over the course of a week. Record the direction of stem growth and root growth from each seed. Did the direction the seed was facing influence the growth?

Labelling a Salad Bar
Create a salad bar with an assortment of plant samples and have students label the organs of each. Students should take one of each sample and develop a means of testing its water content. Once the results have been obtained, they should write the measured water content on each sample's label. Next, invite class members to load up their plates with healthy veggies! Before dining, students should weigh the total contents of their plates and estimate the total water content. While enjoying their salads, students can share estimates of what percentage of the water they consume each day comes from plants.