



Lesson: Plants We Use and Eat

Location: Classroom and outdoor green space

Time: 1-1.5 hours

Grades: K-5

Standards:

- Science and Engineering Process Standards K-5
- **K.PS.1** Plan and conduct an investigation using all senses to describe and classify different kinds of objects by their composition and physical properties. Explain these choices to others and generate questions about the objects.
- **K.LS.1** Describe and compare the growth and development of common living plants and animals.
- **K.LS.2** Describe and compare the physical features of common living plants and animals.
- **K.LS.3** Use observations to describe patterns of what plants and animals (including humans) need to survive.
- **1.LS.2** Develop a model mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. Explore how those external parts could solve a human problem.
- **1.LS.3** Make observations of plants and animals to compare the diversity of life in different habitats.
- **1.LS.4** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.
- **2.PS.1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- **2.LS.2** Compare and contrast details of body plans and structures within the life cycles of plants and animals.
- **2.LS.3** Classify living organisms according to variations in specific physical features (i.e. body coverings, appendages) and describe how those features may provide an advantage for survival in different environments.
- **3.LS.2** Plan and conduct an investigation to determine the basic needs of plants to grow, develop, and reproduce.
- **3.LS.3** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
- **4.LS.2** Use evidence to support the explanation that a change in the environment may result in a plant or animal will survive and reproduce, move to a new location, or die.
- **4.LS.3** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction in a different ecosystems.
- **5.LS.2** Observe and classify common Indiana organisms as producers, consumers, decomposers, or predator and prey based on their relationships and interactions with other organisms in their ecosystem.



STEM Careers: Food Flavorist

Many of the foods we consume contain both natural and artificial flavors. The term artificial, of course, means man-made: specifically, made by scientists. Food flavorists focus on improving product taste and product nutrition, ensuring that any added chemicals do not jeopardize the safety of food consumption. A background in chemistry for this career is super important, as you're dealing with chemicals and their effects on a daily basis. Fun fact: A cubicle/office is no place for a food flavorist. Rather, they often spend their days in a laboratory environment, conducting daily experiments.

Source: <http://www.stemjobs.com/awesome-stem-careers-for-food-lovers/>

Background Information:

Humans use plants and plant parts in a variety of ways. Plants provide food in the form of fruits, vegetables, cereal grains, and seeds. As a product of photosynthesis, green plants provide oxygen. Plants are also used as building materials (timber), textiles (cotton, paper), medicine (aloe), biofuels (ethanol), and scents (perfumes).

Difference between Fruits and Vegetables:

An apple is a fruit, right? So is a banana. How about a cucumber? A vegetable, right? Not really, from a botanical standpoint.

The good news is that, nutritionally speaking in terms of what you should eat daily, fruits and vegetables are typically grouped together, so you can simply pick your favorites and eat away without completing a science degree. The surprising news is that, scientifically speaking, many of the foods we refer to as vegetables are actually fruits!

For instance, would you believe that beans, corn, bell peppers, peas, eggplant, pumpkins, cucumbers, squash and tomatoes are all fruits? That's because, botanically speaking, fruits are the part of flowering plants that contain the seeds and are the means by which such plants disseminate those seeds.

So even nuts are fruits. Grains, which are really just oversized seeds, are also fruits.



So what about vegetables? Botanically speaking, vegetables are all the other parts of the plant, including the leaves (e.g. lettuce and spinach), roots (e.g. carrots and radishes), stems (e.g. ginger and celery) and even the flower buds (e.g. broccoli and cauliflower).

To sum it up – if it is from a plant and has seeds (or would have seeds if it wasn't genetically engineered or cultivated to not have them, as with things like seedless grapes), it is a fruit; if it doesn't, it is a vegetable.

So why in the world do we learn that such things as peppers, corn and cucumbers are vegetables? Why when we shop in the produce section of the grocery store are these foods found in the veggie section? We can blame it on the culinary traditions where the part of the plant we are eating does not generally matter in terms of its classification – taste does! When it comes to cooking, fruits are generally sweet tasting and vegetables are more savory and less sweet. Fruits are also typically served as part of dessert or as snacks, and vegetables are often part of the main dish.

Source:

<http://www.todayifoundout.com/index.php/2013/09/what-is-the-difference-between-fruits-and-vegetables/>

Food from Plants

Plants are very useful to us and we get most of our food from plants. Everybody needs food to stay alive. Food is one of our basic needs. It gives us energy to work. Most of our food comes from plants. Plants give us many things.

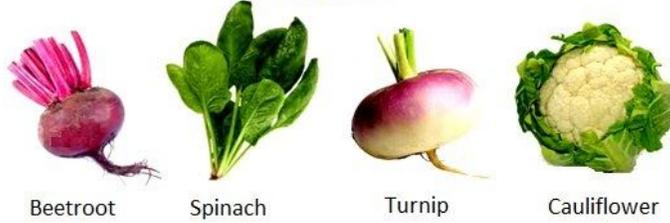
Food we get from plants:

Plants give us vegetables, fruits, cereals and pulses. Plants also give us coffee, tea, sugar, oil and spices. We get food from different parts of plants. We eat roots, leaves, stems, flowers and fruits of plants.

Vegetables: We get vegetables from plants. Some vegetables are available throughout the year. Some vegetables are available in one season only. Some vegetables are beetroot, spinach, turnip and cauliflower.



Vegetables



We eat roots, leaves, stems and flowers of some plants as vegetables.

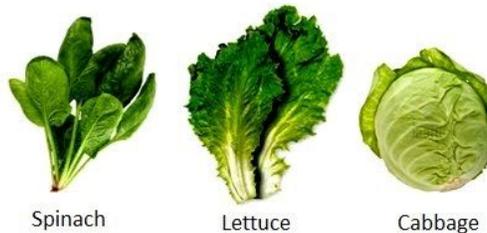
Roots: Beetroot, radish, carrot, and turnip are some of the roots that we eat as vegetables.

Roots as vegetables



Leaves: Spinach, lettuce and cabbage are some of the leaves that we eat as vegetables.

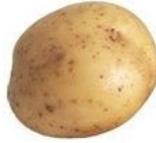
Leaves as food



Stems: Potato and ginger are some of the stems that we eat as vegetables.



Stems as vegetables



Potato



Ginger

Flowers: Broccoli and cauliflower are some of the flowers that we eat as vegetables.

Flowers as food



Broccoli



Cauliflower

Fruits: We get fruits from plants. Fruits are of many kinds. Some fruits are juicy and fleshy. Some of the fruits that we eat are orange, mango, apple, grapes, etc.

Fruits as food



Mango



Orange



Apple



Grape

Cereals: We get cereals from plants. Cereals are the grains that can be eaten. Rice, wheat, maize (corn), and barley are some of the cereals that we eat.

Cereals are the grains



Rice



Wheat



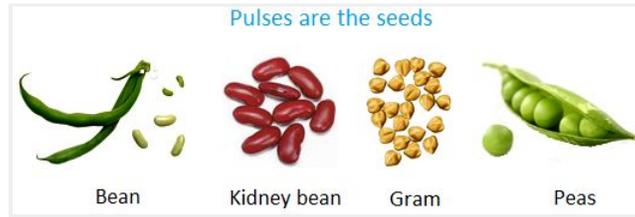
Maize



Barley



Pulses: We get pulses from plants. Pulses are the seeds that can be eaten. Beans, kidney beans, grams (chickpeas), and peas are some of the pulses that we eat.



Coffee, Tea and Sugar: Plants give us coffee and tea to drink. Coffee is made from the seeds of coffee plants. Tea is made from the leaves of tea plant. We also get sugar from plants. Sugar is made from sugarcane.



Oil: We get oil from some plants. The seeds of some plants are used for making oil. Some of the plants that give us oils are castor, sunflower, mustard and coconut.



Dry Fruits: Some plants give us dry fruits. Some of the dry fruits are cashews, groundnut (peanuts), walnuts, and almonds.



Dry fruits



Cashewnut



Groundnut



Walnut

Spices: Plants also give us spices. Cinnamon, cardamom, clove, pepper, turmeric, ginger, cumin seeds and pepper are some of the plants that give us spices.

Spices



Cinnamon



Cardamom



Clove



Pepper

Plants are very useful in many ways. We get most of our food from plants.

Source: [http://www.first-learn.com/food-from-plants.html#gallery\[pageGallery\]/11/](http://www.first-learn.com/food-from-plants.html#gallery[pageGallery]/11/)

Literature Connections: *How We Use Plants* Series by Sally Morgan (*How We Use Plants for Food, How We Use Plants for Shelter, How We Use Plants for Making Everyday Things, How We Plants for Medicine and Health*), *We Can Eat the Plants* (Learn to Read Science Series) by Rozanne Lanczak Williams. *Tops & Bottoms* by Janet Stevens

Materials: Samples of common non-food plant products (wood, cotton, perfume, aloe, etc.), copies of Parts of a Plant diagram, scissors, glue sticks, samples of some fresh fruits and vegetables (for example, asparagus, bell peppers, broccoli, carrots, cucumbers, lemons, lettuce or spinach, radishes, tomatoes, etc.), plastic knives, paper plates



Preparation: Collect some samples of non-food plant products, make copies of Parts of a Plant diagram and cut to size, purchase/gather other materials, and set up plates with a variety of fruits and vegetables for dissection.

Directions:

1. Engagement and Snack:

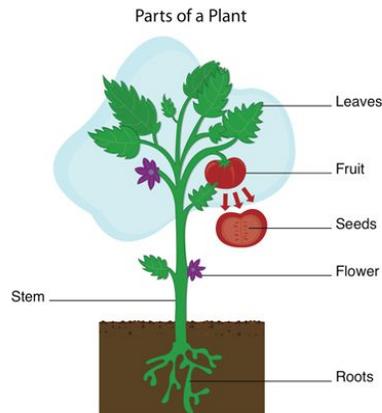
a. Questions/Prompts:

- i. What are some ways humans use plants and plant parts?
- ii. What are some plants that we eat? From what part of the plant does each of these foods come?

b. Activity: Look at the samples of common non-food plant products. Try to identify each one and how it is a plant product.

2. Introduction:

a. Review the main parts of plants. Draw a diagram in journal or glue in a copy.



b. Today we will be focusing on the different parts of plants that eat as food. We eat different parts of many different plants. We eat fruit, vegetables, seeds, leaves, stems, and even flowers.



3. Nature walk. Observe different plants and look for the different parts of each plant: leaves, stems, roots, flowers, seeds, fruit, etc. Discuss how parts of plants are used.

4. STEM Activity:

- a. Discuss the difference between fruits and vegetables
 - i. Fruit = the edible part of the plant that contains the seeds.
 - ii. Vegetable = any edible portion of the plant that does not have seeds
- b. Demonstrate how to dissect (cut open) food samples to determine if they are fruits or vegetables. Show at least one fruit and vegetable to help students see the difference.



- c. Tell students that they will work with their groups to carefully dissect each item on their plate. They need to figure out if each is a fruit or vegetable.
- d. Pass out plates with fruit/vegetable samples and plastic knives.
- e. Allow the students to dissect and categorize the food items into fruits and vegetables.



- f. Discuss results. For each vegetable, have students identify which part of a plant it is.

Plant Parts	Vegetable
Leaves	Cabbage, lettuce, spinach,
Roots	Carrot, radish, turnip
Flowers	Broccoli, cauliflower
Stems	Celery, asparagus, potato

- g. Have students make a t-chart of fruit and vegetables in their journals.
- h. Have students make sketches of outside and inside of some sample of fruits and vegetables.
- i. Extension: Allow students to taste a sample of each fruit and vegetable.

Be sure there are no allergies.

5. Reflection:

- What are some parts of different plants that we eat?
- What is the difference between fruits and vegetables?
- What about the foods we looked at and learned about today surprised you?



- d. Other than as food, what are some ways people use plants?

6. Differentiation Suggestions:

- a. K-1: Focus on using the five senses to describe; have samples they can taste. Have students focus on plant parts above the ground and below the ground, using *Tops & Bottoms* book to set the stage for their own exploration. Sorting foods into categories, such as tops/bottoms and fruits/vegetables will be a good exploration for this age.
- b. 2-3: Focus on specific plant structures and functions of each; have a visual model of plant parts before the hands on portion of the lesson. Sorting by specific plant structures, then identifying other plants that could fit into these categories would work with these standards.
- c. 4-5: Focus on specific plant structures and functions, including adaptations to improve survival of the plan. Have students create their own models after plant dissection, labeling diagrams they create in detail using content vocabulary.