

What We Eat - Part 1

Subjects Taught: Science, Nutrition, Language Arts

Grade Levels: Kindergarten - 2nd Grade

Brief Description: Students will sort fruits and vegetables by examining plants - grown in the school garden, purchased in the market, or featured in models or pictures - into the parts of the plant eaten as food, identify a serving size, and locate where on MyPlate the food belongs.

Objectives: The students will:

1. Identify the parts of the plant.
2. Sort fruits and vegetables by plant part.
3. Sort images of produce into botanically correct fruits and vegetables.
4. Place sorted fruits and vegetables into *MyPlate*.
5. Describe and provide a general explanation of the nutrients provided by fruits and vegetables.

Life Skills: Analyzing, applying, collaborating, comparing similarities and differences, contrasting, categorizing, identifying, observing, sharing observations, sorting and understanding cause and effect

Materials Needed:

- Plants for students to dissect
- Plastic knives to use for dissection
- Paper towels to dissect on
- Fruits and vegetables from the school garden, pictures of fruits and vegetables, models of fruits and vegetables and/or purchased fruits and vegetables
- Copies of student handout *Parts of the Plant* – one per student

- Copies of student quiz *What We Eat* – one per student
- Grocery store advertisements with fruits and vegetables listed and pictured
- Scissors
- Tape or glue
- Music for parading
- *Tops and Bottoms* by Janet Stevens

Time:

Activity One: 45 minutes, plus time for student work

Activity Two: 45 minutes

Activity Three: 30-40 minutes

Activity Four: 30 minutes

Preparation:

1. Decide what portion of the background information is appropriate for your students.
2. Make copies of the student handouts and quiz, one per student.
3. Collect grocery store flyers and seed catalogs for pictures.

Vocabulary:

Flower, food, fruit, leaf, produce, root, stem

Background Information:

What are we eating? Is it a root? Is it a stem? Is it a leaf? Is it a fruit? Is it a seed? Is it actually a vegetable? Few adults could answer correctly. Some of the confusion is due to common use terminology versus the correct scientific designation between what is a fruit and what is a vegetable. If a food is sweet or served as dessert, we have considered it a fruit. Actually, there is a scientific botanical designation of fruit. In laymen's terms, if it has a seed or is a seed it is, botanically, the fruit of the

Florida Standards Met At-A-Glance

National Next Generation Science	K-LS1-a., K-PS1-c
English/Language Arts	K.W.1.2, K.W.3.7, K.W.3.8, 1.W.3.8, 2.W.3.8, K.SL.1.1, K.SL.1.2, K.SL.1.3, K.SL.2.4, K.SL.2.5, 1.SL.1.2, 1.SL.1.3, 1.SL.2.4, 1.SL.2.5, 2.SL.1.2, K.L.3.5, K.L.3.6, 1.L.3.5, 1.L.3.6.
Mathematics	K.MD.2.3
Social Studies	SS.K.E.1.4
Physical Education	PE.1.L.2.8, PE.1.R.1.3, PE.2.L.2.11
Science	SC.K.L.14.3, SC.1.L.14.2, SC.1.L.17.1, SC.2.L.17.1

plant. So, grains are plant fruits. Tomatoes are plant fruits. Cucumbers, squash, and pumpkins are all plant fruits.

So, what are vegetables? Vegetables are the vegetative part of the plant and the reproductive part of the plant before they bloom and set fruit and seed.

Vegetables are:

Leaves: head lettuce, leaf lettuce, cabbage, spinach, bay leaves, oregano, sage, parsley, basil, rosemary, thyme, tea, dill weed, cilantro, mint

Modified Leaves: onions, celery, Brussels sprouts, garlic

Flowers: broccoli, cauliflower, artichoke, cloves, saffron

Stems: cinnamon, asparagus

Modified Stems: potatoes, turnips, ginger

Roots: carrots, beets, parsnips, sweet potatoes, radishes, turmeric

Botanical Fruits are:

almonds, apples, bananas, barley, beans, black walnuts, blueberries, brazil nuts, cacao (source of chocolate), cantaloupes, cashews, cherries, coconuts, cola nuts, corn, cucumbers, currants, dates, figs, gooseberries, grapes, hazelnuts, hickory nuts, lemons, limes, mangoes, oats, oranges, peaches, peanuts, peas, pecans, peppers, plums, pumpkins, raspberries, rye, snow peas, sorghum, squash, sweet corn, strawberries, tomatoes, walnuts, watermelon, wheat

Spices from Botanical Fruits are:

allspice, chili powder, caraway, cardamom, coriander, dill seed, mace, mustard, nutmeg, paprika, pepper, vanilla, cinnamon

Of course, it isn't always so simple. Strawberries, commonly considered a fruit, are the one major exception from a scientific perspective. The fruit is actually the seed on the outside of the strawberry. The sweet, juicy portion that we eat strawberries for is actually a vegetative holder of the seeds and not truly a fruit.

For some food plants, both the fruit and vegetative portions are used. This is true with dill. The leaves are used as dill weed, the immature flower heads are used as a flavoring in dill pickles, which are vegetative. The dill seed (fruit) are also used in making dill pickles and as a spice. The leaves of the cilantro plant are used in Mexican cooking as an herb (vegetative) but when the plant develops seed (fruit) it is used as a spice and is known as coriander.

The nutrition of various fruits and vegetables is directly related to the plant structure and purpose of that portion of the plant. For example, seeds need a great deal of energy to sprout and

push through the soil to reach the light. In order to accomplish these feats, the seed must be a storehouse of energy. So seeds store carbohydrates and lipids (fats and oils). Fats and oils contain more than twice the calories of carbohydrates and protein, gram for gram. Seeds also need protein to form the structure of the new plant prior to it being able to conduct photosynthesis and create new protein. So, a seed contains oil or fat, protein, and carbohydrates in the form of starch and cellulose. All of our major grain crops are seeds: corn, wheat, rice, oats, barley, rye, quinoa and soybeans. Some crops are raised primarily for oil production such as rapeseed used to produce canola oil. All of our nuts are seeds.

Vegetative parts of the plant contain cellulose or in some cases lignin (woody fibers), which provides strength to the structure of the plant. Humans cannot digest cellulose or lignin so this provides us with fiber. The vegetative parts of the plant are operation centers of plants. Photosynthesis takes place in the leaves and stem. Transportation occurs in the roots, stem and venation in leaves. Food storage is conducted in the leaves, stem and roots depending on the plant, which is where sugars, starches, vitamins and minerals are found.

Introduction

1. Review with students the parts of the seed and process of seed germination. A good website is the Arizona Cooperative Extension Master Gardener's site at www.ag.arizona.edu/pubs/garden/mg/botany/seeds.html
2. Review photosynthesis as appropriate. Students should be able to explain that plants produce food by capturing the energy of sunlight and that all foods begin with plants.
3. Either collect grocery store flyers or ask students to bring in grocery store flyers that contain fruits and vegetables from the newspaper.

Activity One: Parts of a Plant

1. **Opener:** Read the book *Tops and Bottoms* by Janet Stevens. Ask: "What difference would it have made if Bear knew more about the food plants in the garden?" Explain that that is what we are going to find out.
2. **I do:** Display the image of the plant.
3. **I do:** Explain that the roots take in water and nutrients, the stem helps transport those nutrients and water up to the leaves and flowers and leaves take in sunlight and air (CO₂ during the day and O₂ at night) to produce food.
4. **I do:** Provide students a copy of the handout *Parts of the Plant*.
5. **We do:** Have each team of two students dissect a plant and correctly place each part on their *Parts of the Plant* handout on page 55.

- We do:** Together, each pair of students decides what the name of that plant part is.
- You do:** Have each student label the roots, leaves, flowers, and stem on the *Parts of the Plant* handout.

Activity Two: Fruits or Vegetables?

- Opener:** Have students brainstorm a list of fruits and vegetables or foods made from fruits and vegetables. Make a list and post the list in a visible place.
- I do:** Explain the difference between fruits and vegetables. (If it is a seed or has a seed it is botanically a fruit. If it is the leaf, stem, flower or root of a plant it is a vegetable.) Create a class T-chart to show what produce is botanically a fruit and what is a vegetable.
- We do:** Have students think about a fruit then share their choice with the class. Add it to the T-chart and repeat the process with a vegetable.
- You do:** Have students create their own T-chart with fruits on one side and vegetables on the other. Using grocery store ads have students cut out images of fruits and vegetables and paste or tape them onto the correct area of their T-chart.

Fruits	Vegetables
	
	
	

Activity Three: Plants We Eat

- Opener:** Have students brainstorm the plants we eat and what part of that plant we eat and post a list in a visible place.
- I do:** Show students various plant parts and identify whether they are leaves, stem, flower, or roots.
- We do:** Have students select a fruit or vegetable image from one of the grocery store flyers as their example.

Divide the class in half and make one half form a circle this will be the inside circle and the other half form the outside circle. Have the inside circle parade clockwise and the outside circle parade counterclockwise when the music plays. When the music stops the person nearest them is their partner. Have the students show their partner their produce example. The partner must identify what part of the plant the fruit or vegetable is. Repeat several times to practice identifying plant parts that are eaten. Ask each student to remember what examples their partners had and which plant parts those examples represented.

- You do:** Have students complete the *What We Eat* quizzes on pages 54 and 57.

Activity Four: MyPlate

- We do:** Have the students identify where the fruits and vegetables fit in *MyPlate* on page 58.
- We do:** Have students brainstorm all of the seeds or foods from seeds they can think of, the foods made from those seeds and make a list in a visible place. Students may work together in small groups and younger students may need to have categories provided.

Corn: corn tortillas, corn chips, corn flakes, corn puffs, corn cereals like Captain Crunch, corn oil

Wheat: bread, egg noodles, pizza crust, crackers, cereals, spaghetti, muffins, cakes, cupcakes

Oats: oatmeal, Cheerios, Honey Bunches of Oats, Granola, oat cakes

Soybeans: Edamame, tofu, soy nuts, soymilk, vegetable oil, *Rice:* rice, puffed rice cakes, Rice Krispies, many of the Chex cereals, Rice-a-Roni, rice pudding;

Coconut, Cacao (chocolate), Nuts, Peanuts

- I do:** Ask: "Where do these foods from seeds fit in *MyPlate*?"
- We do:** Ask: "What is a serving size for fruits, vegetables, and a food made from seed such as bread?" Discuss using the recommendations at www.choosemyplate.gov/ or use the student workbooks at <http://www.fns.usda.gov/tn/discover-myplate-student-workbooks>.
- You do:** Have students create their own diorama, poster or illustration depicting their favorites including one from each part of the plant and include where their favorites fit on *MyPlate*.

Evaluation Options:

- Assess student work on the two handouts for accuracy and completion.
- Have the students complete the *What We Eat* quiz and assess the accuracy.

3. Have student identify foods from leaves, roots, flowers, and/or stems that are grown in the school garden and place them into categories for leaves, stems, roots, flowers and seeds.
4. Have students create their own *MyPlate* using grocery store flyers that include fruits and vegetables, and carbohydrate foods such as bread, pasta, rice, or noodles, meat, and milk. Have students identify serving sizes and cost to purchase the food.
5. After lunch, have students categorize the foods in the school lunch into parts of the plant.

Extensions and Variations for Early Elementary Students:

1. Enlist the assistance of the school cafeteria to include kid-friendly vegetables in the school meal. Ideas can be found at www.choosemyplate.gov/food-groups/downloads/Ten-Tips/DGTipsheet11KidFriendlyVeggiesAndFruits.pdf

Resources:

Arizona Master Gardeners, Arizona Cooperative Extension, www.ag.arizona.edu/pubs/garden/mg/botany/seeds.html

Florida Master Gardeners, University of Florida Cooperative Extension www.gardeningsolutions.ifas.ufl.edu/giam/index.html

MyPlate, United States Department of Agriculture, www.choosemyplate.gov/

Stevens, Janet. *Tops and Bottoms*. Houghton Mifflin Harcourt. 1995. ISBN-13: 978015292513.



What We Eat

Sample Pre-Post Assessment

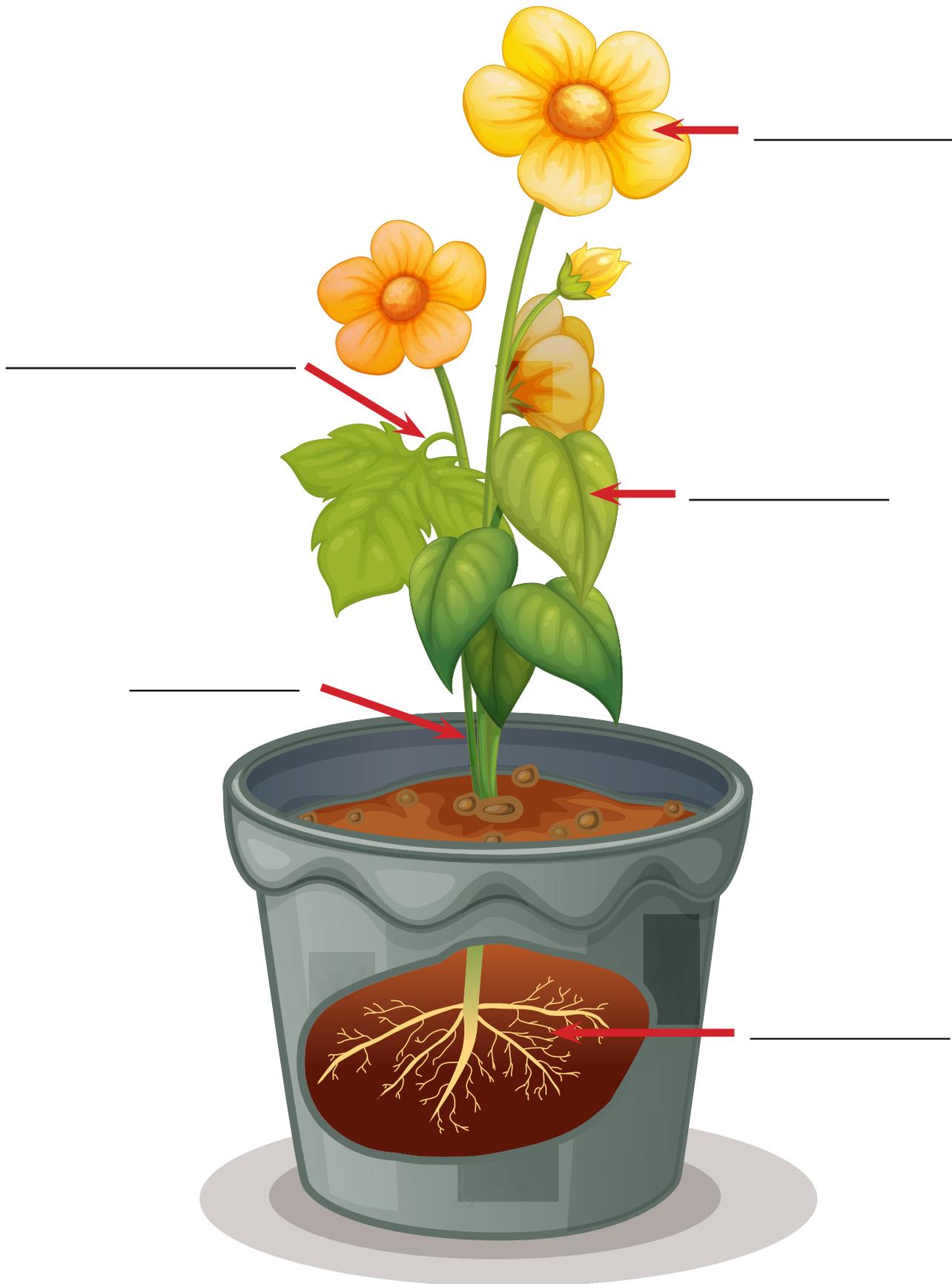
1. Name one vegetable that we eat that is a root:

2. Name a leaf that we eat as food:

3. What are three foods made from seeds?

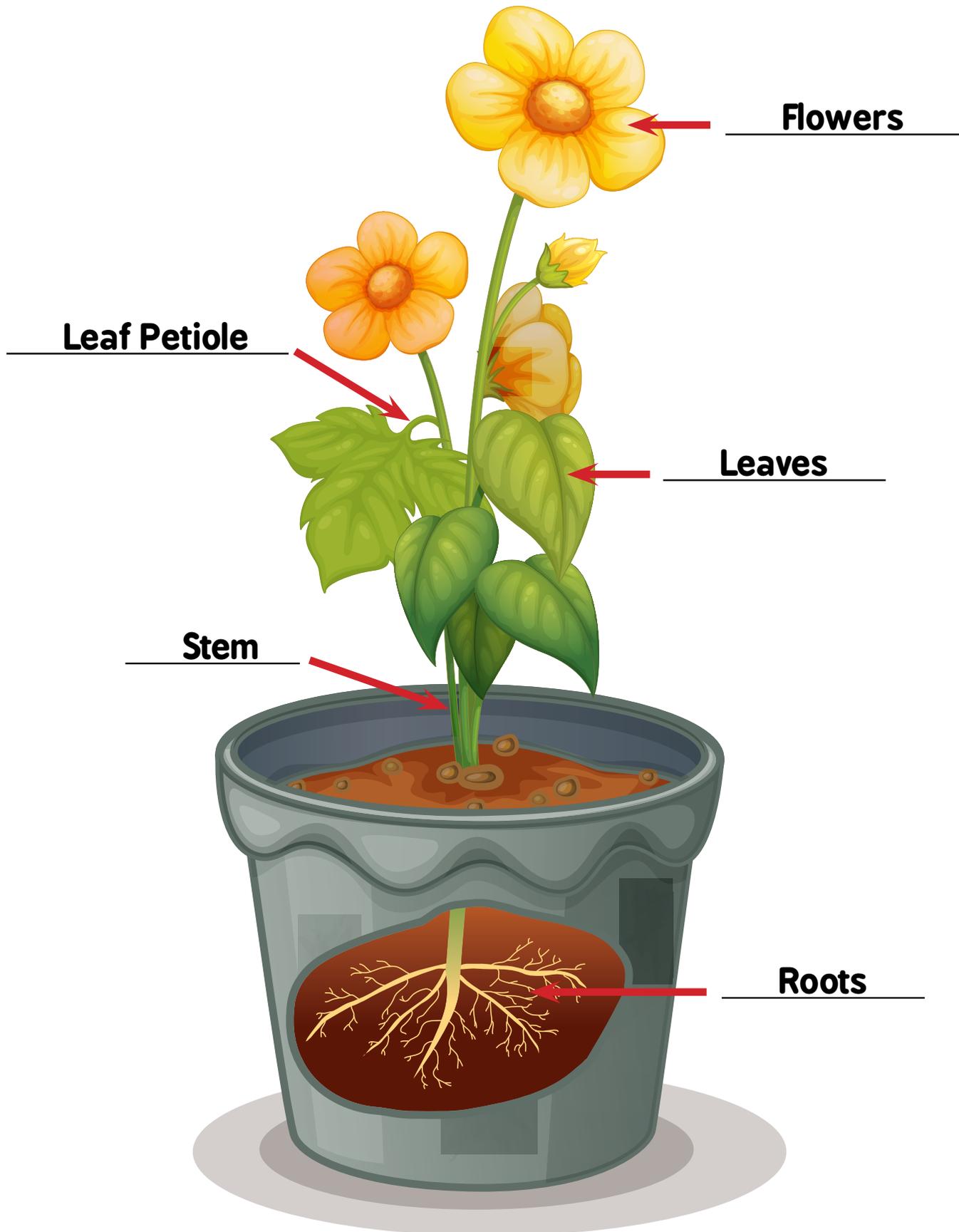
Parts of the Plant

Name: _____



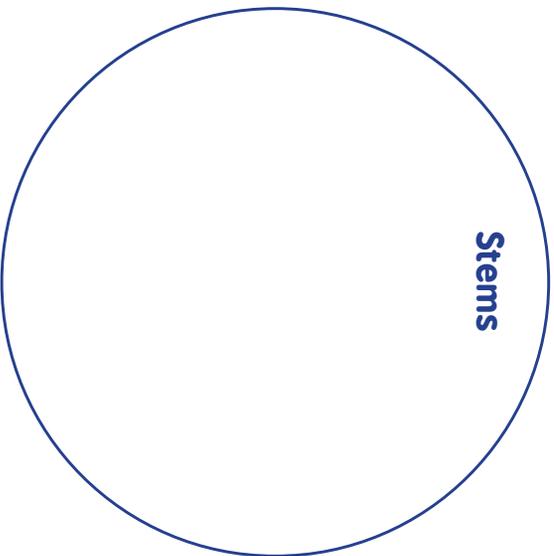
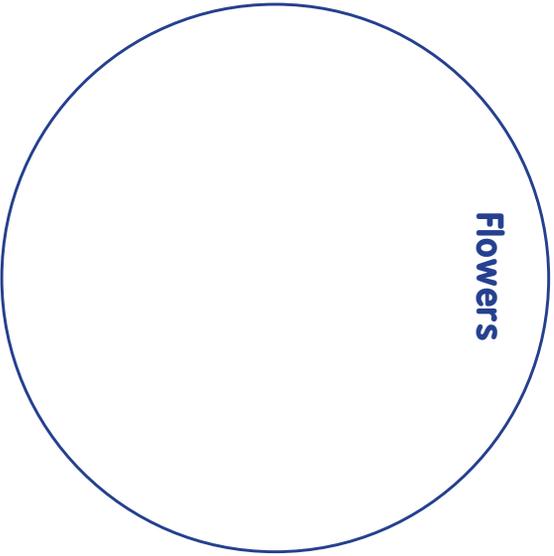
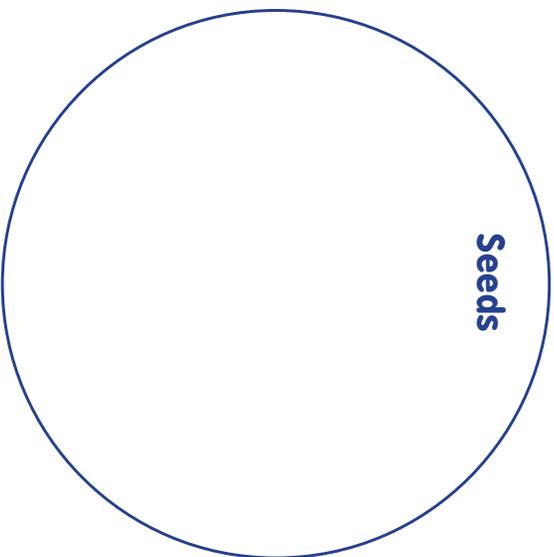
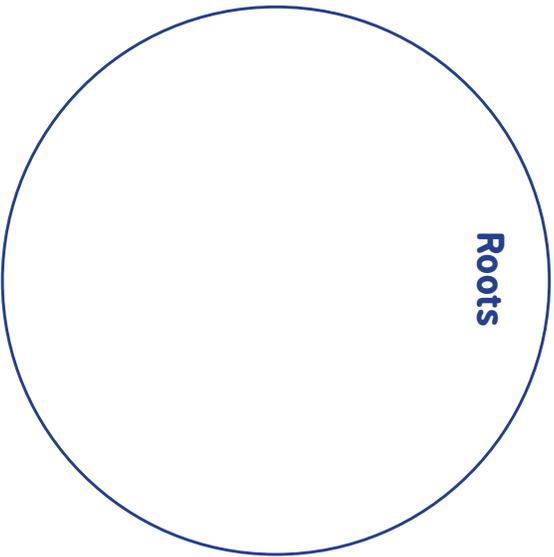
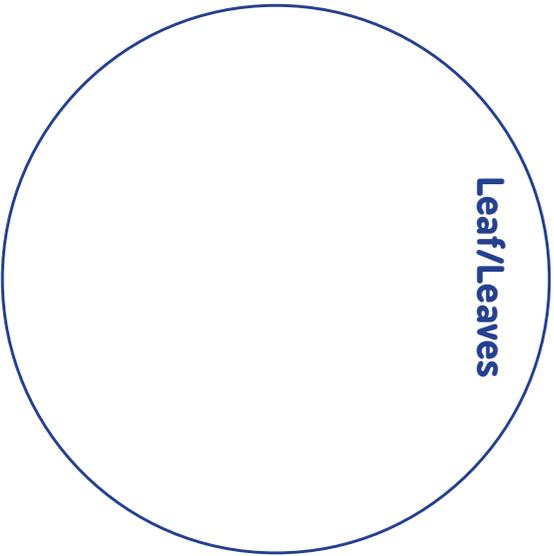
Parts of the Plant

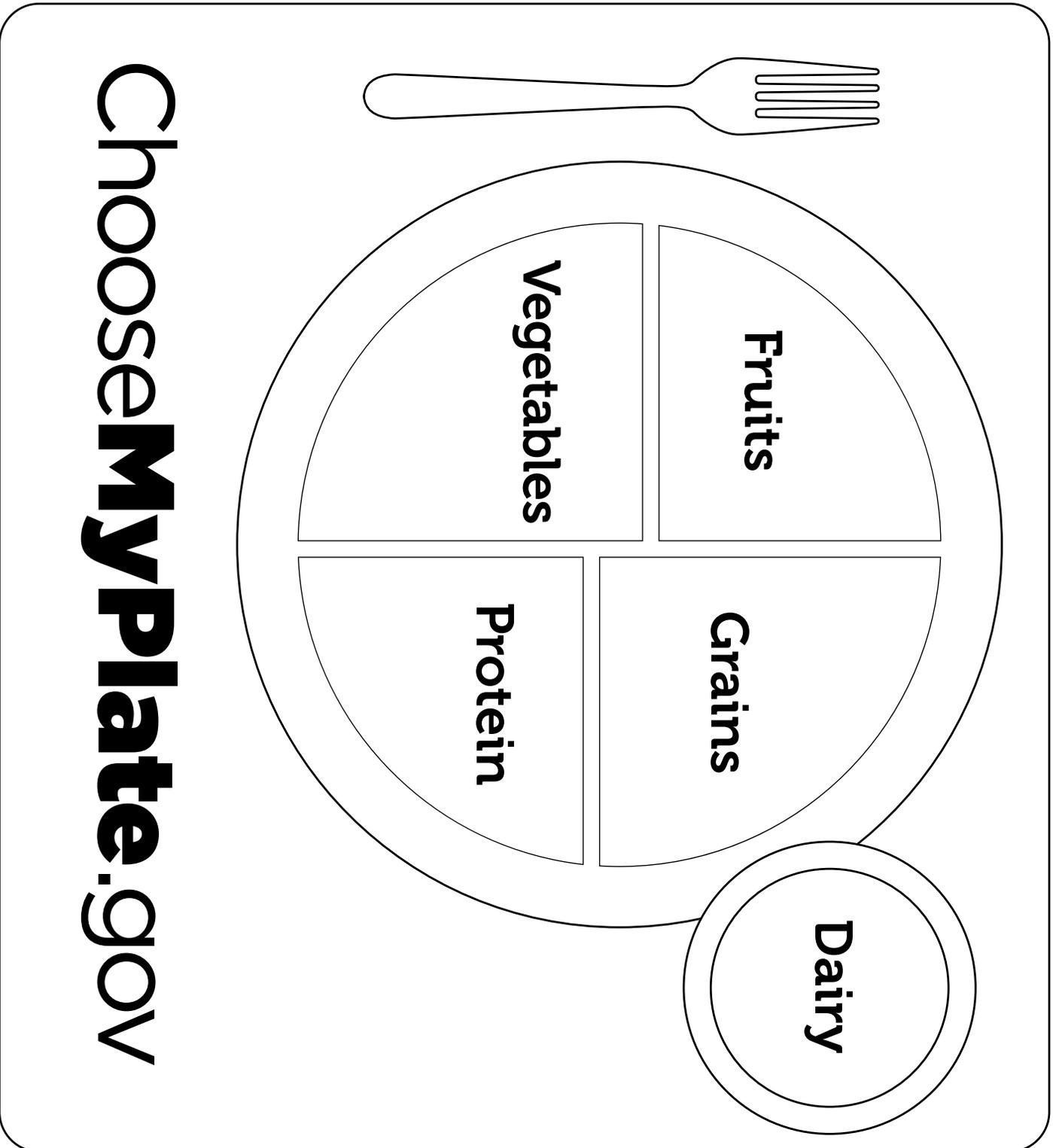
Name: Answer Key



What We Eat Quiz

Name _____
Put a picture of the food we eat on its plant part.





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