**Plants We Eat: Exploring Fruits and Vegetables**

**Instructor’s Guide**

*Learning objectives:*

* Identify which parts of the plant are represented by common fruits and vegetables
* Describe the functions of different parts of the plant (e.g., stem, root, tuber, fruit, leaf, flower)
* Describe how the function of one part of the plant affects the function of another part of the plant
* Compare and contrast “grocery store” varieties of common fruits and vegetables and their “wild” relatives and explain why the two differ
* Describe how plant fruits differ in structure (i.e., what are some different types of fruits?) and how these differences in structure relate to the modes of fruit dispersal

**Before class:**

1. Set out approximately eight different fruits and vegetables for each lab group. There should be at least one fruit/vegetable from each of the following categories:

|  |  |  |
| --- | --- | --- |
| **Category** | **Examples** | **Function(s)** |
| Stem | * Celery
* Rhubarb
* Potato (tuber)
 | * Transport of nutrients and water throughout the plant
* Maintain plant structure
* (Tuber) sugar storage
 |
| Bulb (originates from stem) | * Onion
* Garlic
* Shallot
 | * Nutrient storage, especially during dormancy
 |
| Root | * Carrot
* Radish
* Beet
 | * Turnip
* Rutabaga
* Daikon
 | * Nutrient storage, especially during dormancy
 |
| Leaf | * Lettuce
* Kale
* Cabbage
 | * Collard greens
* Arugula
* Brussels sprouts
 | * Photosynthesis
* Transpiration
 |
| Flower | * Cauliflower
* Broccoli
* Artichoke
 | * Reproduction: enables pollination, which leads to fertilization and development of seeds
 |
| Seed | * Almond
* Cashew
* Bean
* Pumpkin seed
* Walnut
 | * Reproduction: new plant develops from seeds
 |
| Fruit | * Pepper
* Cucumber
* Eggplant
* Tomato
* Green beans
* Zucchini
* Squash
* Apple
* Cherry
* Berry
* Watermelon
 | * Pear
* Orange
* Pineapple
* Lemon/lime
* Grape
* Banana
* Plum
* Peach
* Kiwi
* Sunflower seed (in shell)
 | * Reproduction: seed dispersal, nourishment, and protection
 |

1. Make copies of the article *Fruits and vegetables used to look so different you might not even recognize them* found at the following website: <https://www.courant.com/health/hc-wapo-fruits-veggies-story.html> (1 per student).
2. Have the video indicated at the top of the article ready to show before the students read the article.
3. Lay out herbarium specimens (from the teaching collection) that show examples of the following types of fruits:

|  |  |  |
| --- | --- | --- |
| **Fruit Type** | **Example species** | **NOT examples** |
| Animal-dispersed fruit | *Bidens, Cenchrus, Ilex vomitoria, Galium, Vaccinium, Vitis, Crataegus, Solanum, Frangula, Xanthium* |  |
| Wind-dispersed fruit | *Acer, Fraxinus,* any Asteraceae with a prominent pappus such as *Erigeron, Liatris, Senecio, Packera, Taraxacum* |  |
| Simple fruit | Any of the animal- or wind-dispersed fruits described aboveAny of the achenes, capsules, legumes, or nuts described below.  |  |
| Aggregate fruit | *Fragaria, Rubus* | *Morus* |
| Multiple fruit | *Morus* | *Fragaria, Rubus* |
| Achene | *Fraxinus, Ulmus* |  |
| Capsule | *Lilium,* orchids such as *Epidendrum, Platanthera, Pogonia,* mustards such as *Capsella, Brassica, Cakile, Cardamine, Rorippa,*  |  |
| Legume | Most Fabaceae such as *Crotalaria, Indigofera, Lathyrus, Lupinus, Senna, Vicia* |  |
| Nut | *Carya, Quercus* |  |

1. Make longitudinal or cross sections of at least ten fruits. Make sure you can locate seeds and other structures such as the ovary wall.
2. Familiarize yourself with identifying the parts of plants represented by fruits and vegetables and the functions that these structures have for the plant.

