



## Understanding the Plants we eat: Lesson 1: Classification

### **Overall Annotation:**

This is a multi-task activity that consists of 2 lesson plans that will allow students to gain a greater understanding of the basic structures of plants, their nutritional and medicinal values, and how these plants gain their nutrients. The lessons vary from simple identifications and classifications of edible plants to complex scientific investigation of plant growth. These lesson plans can be used in the recommended order or individually as needed.

**Annotation:** This is a series of simple identification and classification activities that can be used as an introductory to the plant unit. The students will use fruits and vegetables to identify the basic and reproductive structure of plants and also classify them into different groups such as monocot and dicot.

### **Georgia Performance Standards**

*Major Concept:* Plant Characteristics

**SCSh7: Students analyze how scientific knowledge is developed.**

b. Universal principles are discovered through observation and experimental verification

### **Internet Resources:**

**Title:** Flowers, fruits and seeds

**Website:**

Kellogg Community College; Flowers, Fruits and Seeds

[http://academic.kellogg.edu/herbrandsonc/bio111/seeds\\_fruits\\_flowers.htm#structures](http://academic.kellogg.edu/herbrandsonc/bio111/seeds_fruits_flowers.htm#structures)

**Annotation:** This website serves as a resource to help give background information and definitions of key terms for each classification activities.

### **Total Duration:**

Each classification activity: 15-20 minutes

Total: 60 - 80 minutes

### **Materials:**

Variety of edible plants found in the grocery store. Suggestions provided in list and tables throughout lesson plan.

# Classification and Identification Procedures



## 1. *Classifying of plants into Fruits and Vegetables.*

There should be a good mix of both fruits and vegetables (tables 1 and 2 respectively). First, allow the students to categorize the plants into fruits and vegetables *based on their knowledge* of what fruits and vegetables are. Provide little help at this point.

Once they are done, provide them with the true definitions and allow them to do it again. Since there are so many different definitions of fruits and vegetables allow the students to categorize the fruits vegetables based on the definitions given below.

### *Definitions*

**Fruit = the edible part of the plant that contains the seeds.**

**Vegetable= any edible portion of the plant that does not have seeds**

**Table 1. Fruits**

<b>Type of fruit</b>	<b>Examples</b>
<i>Fleshy</i>	Tomato, Peach, Blueberries Squash
<i>Dry Fruits</i>	Wheat, legumes, nuts
<i>Aggregate</i>	Raspberries, strawberries
<i>Multiple</i>	Pineapple

### **Extension of fruits classifications:**

*Identification and Classification of the four types of fruits provided (Table 1).*

*Identify the regions of a mature fruit (identify the 3 layers of the pericarp).*

Note: The website is very useful for both of these activities.

[http://academic.kellogg.edu/herbrandsonc/bio111/seeds\\_fruits\\_flowers.htm#structures](http://academic.kellogg.edu/herbrandsonc/bio111/seeds_fruits_flowers.htm#structures)

## 2. *Identification and classification of basic plant structures using vegetables:*

Students will be provided with vegetables that represent a certain portion of a plant anatomy. The students should be given time to place vegetables into these four categories with just the basic knowledge that they have about the vegetables. Examples of vegetables and how they should be categorized are below in Table 2.

**Table 2. Vegetables**

<b>Structure</b>	<b>Vegetable</b>
<i>Leaves</i>	Cabbage, Lettuce, Spinach, Celery
<i>Roots</i>	Carrot, Potato, Onion
<i>Flowers</i>	Broccoli, Cauliflower,
<i>Shoots</i>	Asparagus

### 3. Identification of plant reproductive structures:

Allow the students to identify the reproductive structures that are in tables 1 and 2. The students should be able to use previous knowledge to identify which structures are reproductive. Once the students have made their selections, there should be a brief discussion of the reasons they selected these plant structures and the reasons they are right or wrong. Some examples of these reproductive structures are the flowers, the vegetative roots (asexual reproduction) the seeds from the fruit, and seeds in legumes.

### 4. Identification of Monocots and Dicots:

If you have the leaves or seeds from any of these plants, the students also can classify the edible plants into monocot and dicot groups (as shown in the table 3). The students should not classify them into family, and they should have already learned the basic differences between monocots and dicots in their lessons in class. Background information on a separate sheet is provided below and on the website to help you with this activity.

**Table 3**

<b>Monocots</b>		<b>Dicots</b>	
<b>Family</b>	<b>Examples</b>	<b>Family</b>	<b>Examples</b>
Poaceae	Wheat, corn, rice,	Brassicaceae	Broccoli, Cauliflower, turnips, cabbage
Amaryllis	Garlic, narcissus, onion	Fabaceae	Beans, Clovers, peas, peanuts, soybeans
Bromeliad	Pineapple, Spanish moss	Carrot	Carrot, celery, parsley
Coconut	Coconut,	Mint	Rosemary, sage, thyme
Liliaceae	Asparagus	Rosaceae	Apples, peaches, pears, plums
		Solanaceae	Potatoes, tomatoes, peppers

*Note: Corn is a good example of monocot seeds to use when distinguishing from dicot seeds.*

**Assessment:** The students will be evaluated at the end of each classification and identification activity. The ability of the students to classify the plants into the appropriate groups should be an indicator of how well the students have grasped the material. The students should try to classify the edible plants first based on their previous knowledge and with minimal information from you. Discussions and questions at the end of each of the activities should also help with evaluation.

**Background information Sheet for Monocots and Dicots**

**Dicots** = Flowering plants that produce seeds and two seed leaves. Most dicots also produce flowers and flowering parts in multiples of 2, 4, or 5 and leaves with branching, or netted, veins.

**Monocots**= are flowering plants that produce seeds with one seed leaf. Most monocots also produce flowers with flowering parts that are in multiples of three and have long, narrow leaves with parallel veins

<b>Dicots versus Monocots Seeds</b>	
<b>Dicots</b>	<b>Monocots</b>
<ul style="list-style-type: none"> <li>• Two cotyledons</li> <li>• Flower parts in fours or fives</li> <li>• Leaves with distinct vein network</li> <li>• Vascular cambium present</li> <li>• Vascular bundles in ring</li> <li>• Pollen grain with three apertures</li> </ul>	<ul style="list-style-type: none"> <li>• One cotyledon</li> <li>• Flower parts in threes</li> <li>• Leaves with parallel primary veins.</li> <li>• Vascular cambium absent</li> <li>• Vascular bundles scattered</li> <li>• Pollen grain with one aperture</li> </ul>

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