



Science Unit: *Plants and Ecosystems*

Lesson 1: *Let's Sort a Salad_Partageons une salade*

School Year: 2006/2007

Developed for: Queen Elizabeth Annex Elementary School, Vancouver School District

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Grade level: Presented to grades 2-3; appropriate for grades 1 – 4 with age appropriate modifications; Présenté au niveau de la 2^e et 3^e année; approprié aux niveaux de la 1^{re} à la 4^e année en y apportant les modifications nécessaires.

Duration of lesson: 1 hour

Notes: The school in which this lesson was taught is a dual track French Immersion and English speaking school. The lesson was delivered to students in an English speaking class and a French speaking class.

Objectives

1. Review the parts of the plant and their function.
2. Apply scientific reasoning to a science activity.
3. Learn to recognize what plant parts we consume.
4. Learn the true definition of a fruit.

Background Information

Plants are a diverse group of living things that include trees, flowers, grasses, vines, bushes and ferns. The parts of the plant are designed to do very important tasks for the plant (see definitions below). Since plants cannot move like animals do, they have to get their water and nutrients from areas near to them (using their roots). They also make their own food by harnessing the sun's energy by a process known as photosynthesis, which occurs in the leaves. In addition, they can't escape their environment, so in harsh weather they can survive by being anchored to the ground by their roots or by living in a dormant (non-active) state underground (as a bulb). Plants reproduce via their flowers that house the male and female parts of the plant. They disperse their seeds in a number of different ways, one of which is by making a fruit to house the seeds. This lesson will reinforce learning about the parts of the plant and their functions by considering common vegetables and which plant part they represent.

Informations préalables

Les plantes forment un groupe divers d'éléments vivants qui inclue les arbres, les fleurs, les graminées, les vignes, les buissons et les fougères. Les parties de la plante jouent un rôle important pour la plante (voir tableau ci-dessous). Puisque les plantes ne peuvent se déplacer comme les animaux, elles doivent se procurer de l'eau et des nutriments qui se trouvent près d'elles (en utilisant leurs racines). Elles créent également leur propre nourriture en transformant l'énergie du soleil par le processus de la photosynthèse à partir des feuilles. De plus, elles ne peuvent quitter leur environnement. Lorsqu'elles subissent des conditions climatiques difficiles, les plantes peuvent survivre en étant retenues au sol par leurs racines, ou sous la terre, sous la forme d'un bulbe dormant (non-actif). Elles se reproduisent grâce à leurs fleurs, qui contiennent les parties mâle et femelle de la plante. Elles dispersent leurs graines de plusieurs façons. L'une d'entre elles est de créer un fruit qui contiendra les graines. Cette leçon renforcera les connaissances concernant les parties des plantes et leurs fonctions par l'étude de légumes communs et l'identification de la partie de la plante qu'ils représentent.



Vocabulary

| | |
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| Word: | Brief definition. |
| Roots: | Usually below ground, the roots anchor the plant to the ground and provide water and nutrients from the soil. |
| Stems: | Most stems are above ground and can be identified by having buds and/or leaves. Stems carry water/nutrients from the roots and food made in the leaves to the other parts of the plant. The stem works like the human vascular system in a way. The xylem carries the water/nutrients and the phloem carries the food throughout the stem. |
| Leaves: | A leaf is lateral growth from the stem, usually flat, broad, and green. Leaves absorb sunlight and turn it into food by a process called photosynthesis. |
| Flowers: | Flowers are the male and female parts of the plants that are important in the production of seeds. |
| Bulb: | A bulb is an underground food storage system for a plant that is dormant (or not active, but still alive). It allows a plant to survive difficult conditions. |
| Fruit: | A fruit is part of the female element of the plant (the ovary) that is ripened and now contains the seeds. Once the ovary is fertilized, the seeds develop and the ovary enlarges forming the mature fruit. When we talk about fruit, we are referring to anything that houses seeds. |
| Vegetable: | Vegetables are the parts of the plant that we consume. |

Vocabulaire

| | |
|------------------|---|
| Mot: | Brève définition. |
| Racines: | Habituellement sous le niveau du sol, les racines retiennent la plante au sol et procure de l'eau et des nutriments du sol. |
| Tiges: | La plupart des tiges se situent habituellement au-dessus du sol et peuvent être identifiées par leurs bourgeons et/ou leurs feuilles. Les tiges apportent l'eau et les nutriments des racines et la nourriture produite par les feuilles aux autres parties de la plante. D'une certaine façon, la tige travaille comme le système vasculaire chez l'être humain. Le xylème transporte l'eau et les nutriments et le phloème transporte la nourriture dans la tige. |
| Feuilles: | La feuille est la pousse latérale de la tige, habituellement plate, large, et verte. Les feuilles absorbent la lumière et la transforment en nourriture par un processus appelé photosynthèse. |
| Fleurs: | Les fleurs sont les parties mâle et femelle de la plante qui sont importantes pour la production des graines. |
| Bulbe: | Le bulbe est un système d'entreposage de la nourriture sous terre qui est dormant c'est-à-dire non-actif bien que vivant. Il permet à la plante de survivre dans des conditions difficiles. |
| Fruit: | Le fruit fait partie de l'élément femelle de la plante (l'ovaire) qui mûrit et contient les graines. Lorsque l'ovaire est fertilisé, les graines se développent et l'ovaire grossit, formant ainsi le fruit mûr. Lorsque nous parlons d'un fruit, nous faisons référence à tout ce qui contient des graines. |
| Légumes: | Les légumes sont des parties de la plante comestibles. |



SCIENTIST IN RESIDENCE PROGRAM

Materials

All the materials are fruits and vegetables that can be bought at your local grocery store.

- Flowers: broccoli, cauliflower
- Fruits: apples, oranges, green beans, tomatoes, peppers, cucumbers, etc
- Leaves: spinach, lettuce
- Activity sheet
- Stems: celery, asparagus
- Roots: carrots, radishes, beets
- Bulb: garlic, onions
- Large picture of a plant (with all of it's parts)
- Zip lock baggies
- Extra veggies that might be tricky/exotic
- Magnifying glasses

Matériaux

Vous pouvez utiliser des fruits et légumes de votre marché local.

- Fleurs: brocoli, chou-fleur
- Fruits: pommes, oranges, fèves vertes, haricots, tomates, piments, concombres, etc
- Feuilles: épinards, laitue
- Feuille d'activité
- Tiges: céleri, asperges
- Racines: carottes, radis, betteraves
- Bulbes: ail, oignons
- Grande image d'une plante
- Sacs Zip lock
- Autres légumes plus difficiles à catégoriser/exotiques
- Loupes pour examiner les légumes

In the Classroom

Introductory Discussion

1. HOOK:

- Ask the students what they had for dinner
- Go over a few students' responses and then talk about what the scientist had for dinner: a whole plant! (I.e. roots, flowers, stems, fruits, leaves and seeds, in other words, a salad!)

2. TO REVIEW:

- Review the parts of a plant (using a diagram of a tomato plant, for example, as it has all of the elements that we will be sorting later)
- Review the purpose of each part of the plant (Can have the purpose of each part written on your poster, hidden under a piece of paper. When a student gets the answer correctly, you can reveal that piece. For example: stem=plant pipes, leaves = food factory)

3. SCIENCE ACTIVITY:

Each student will be given a variety of vegetables in a Ziploc bag. They will then try to identify what part of a plant each vegetable represents based on their prior knowledge of what each part looks like and what its function is.



SCIENTIST IN RESIDENCE PROGRAM

4. SECURITY MEASURES:

- If the teacher or the scientist brings a knife to class for vegetable cutting, make sure that the students are instructed not to touch the knife.
- Make sure the students do not eat the vegetables without washing the vegetables and their own hands.

Science Activity/Experiment

Activity 1: Let's sort a salad, Partageons une salade!

Purpose of Experiment: To enable the students to distinguish vegetables as different parts of a plant.

Methods:

Set-up prior to experiment: Place at least one of each vegetable in a plastic Ziploc baggie. Make enough so that there will be enough for groups of 2-3. Photocopy activity sheet (see attached).

Instructions

Give groups of 2-3 students a bag of vegetables and a worksheet. Ask them to try and figure out what part of a plant each vegetable in the bag represents and write it down/draw it out on the work sheet.

Go over the student's guesses together and ask them why they thought a certain vegetable corresponds to a certain plant part.

Have other unique vegetables on hand for students who finish early.

Once all of the students have sorted their vegetables and the correct answers have been discussed, let the students place their vegetables on a large picture of a plant with all the parts labeled. Then let the students sort a variety of other vegetables by placing them onto the appropriate part. You end up with a colourful (and edible) picture of a plant and its parts made up of different vegetables!

Optional Questions:

1. What is a fruit? (the plant part that contains the seeds)
2. Name two fruits that everyone calls a vegetable. (cucumber, tomato, beans, etc)
3. What part of a plant is a carrot? (root)
4. What part of a plant is an onion? (bulb)
5. What is a stem for? (plant pipes)
6. What do leaves do? (make food/sugar for the plant)
7. What is the scientific name for how leaves make food using the sun? (photosynthesis)

Closure Discussion

1. Review plant parts and their functions and which parts can be eaten as food.
2. Talk about the vegetables that actually are fruits.



Optional Questions:

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2. Name two fruits that everyone calls a vegetable. (cucumber, tomato, beans, etc)
3. What part of a plant is a carrot? (root)
4. What part of a plant is an onion? (bulb)
5. What is a stem for? (plant pipes)
6. What do leaves do? (make food/sugar for the plant)
7. What is the scientific name for how leaves make food using the sun? (photosynthesis)

References

1. Burnie, David. 1991. How Nature Works: 100 Ways Parents and Kids Can Share The Secrets of Nature. Pages 38-51, The World of Plants and Fungi. Reader's Digest Association Inc. ISBN: 0895773910
2. http://en.wikipedia.org/wiki/List_of_Externally_visible_plant_parts Wikipedia, the free encyclopedia, [Information about plant parts].
3. <http://www.hhmi.org/coolscience/vegquiz/plantparts.html> [Activity with plant parts and their function].

Notes: A related lesson for English speaking students is available from <http://www.scientistinresidence.ca>, view the Plants science unit; Lesson 6 *Plant Parts and Their Function*.

Extension of Lesson Plan

1. (*Before the lesson*): Go to grocery store and get the students to buy a variety of fruits and vegetables to sort. They can choose from the usual to the unusual. This can also be used as a lesson about budgeting and money.

(*Before the lesson*): A good book to introduce this subject is Tops and Bottoms by Janet Stevens [Harcourt Trade Publishers ISBN: 0152928510 (only available in English)].

2. (*After the lesson*): Using the vegetables that have been sorted, make a vegetable soup as a class. This can also be used as a lesson about nutrition.
3. Do a fruit dissection. Get students to make predictions about the number of seeds in different kinds of fruits. Cut the fruits in half and get students to count the number of seeds present.
4. Demonstration: Test the fruits/vegetables in question for presence/absence of vitamin C by blending the vegetables with some water, then dropping some testing solution (made of 4 drops of iodine, corn starch and water) into the mulched vegetable liquid. The solution, which is blue, will turn clear if there is vitamin C present. **NOTE:** iodine is toxic, do this as a demo only and keep the solution away for the students.
5. Art extension: Students can make prints using cut vegetables/fruits and different paint colours.



Scientifique: _____

Date: _____

Let's Sort a Salad!

Purpose: To figure out plant parts these vegetables represent.

Directions: Draw a picture or write the name of each vegetable in the right category.

| | |
|----------------|------------------------|
| ROOTS | LEAVES |
| STEMS | FRUITS |
| FLOWERS | SOMETHING ELSE? |



Scientist: _____

Date: _____

Partageons une salade!

But: Figurer quelle partie de la plante chaque légume représente.

Directions: Dessinez ou écrivez le nom de chaque légume dans la bonne catégorie.

| | |
|----------------|---------------------|
| RACINES | FEUILLES |
| TIGES | FRUITS |
| FLEURS | AUTRE CHOSE? |