Science Unit: *Plants*

Lesson 10: *Plant Lifecycles*

School Year:	2008/2009
Developed for:	David Lloyd George Elementary School, Vancouver School District
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Grade level:	Presented to grades 1 and 3, appropriate for grades 1-6 with appropriate modifications.
Duration of lesson:	1 hour and 20 minutes

Notes: This is lesson 2 of a science unit comprised of 6 lessons on Plant and Animal Needs and Adaptations. All 6 lesson plans in this unit are listed below and are available from **http://www.scientistinresidence.ca**.

1. Land Plants and Algae: go to the web site above, view the Plants science unit, Lesson 9 *Land Plants and Algae*.

2. Plant Lifecycles: This lesson.

3. Parts of a Flower and Pollination: go to the web site above, view the Soils, Plants and First Nations science unit, Lesson 3 *Parts of a Flower.*

4. What do Snails Eat?: go to the web site above, view the Forest Ecosystem science unit, Lesson 3 *What do snails eat?*

5. Marine Field Trip to Whytecliff Park: go to the web site above, view the Aquatic Ecosystems science unit, Lesson 3 *Marine Field Trip to Whytecliff Park*.

6. Tree Top Canopy Field Trip: go to the web site above, view the Temperate Forest science unit, Lesson 17 *Tree Top Canopy Field Trip*.

Objectives

1. Learn about the lifecycles and stages of flowering plants.
2. Explore parts of plants that we eat.
3. Compare lifecycles of plants with those of animals (including humans).

Background Information

Life cycles occur in all living things. It is the various stages of life including birth, growth, adulthood, reproduction and then death. In flowering plants, seeds are small embryonic plants which are dormant until the right conditions are met (temperature, moisture, oxygen, light or darkness). Once conditions are met for germination, the seed comes out of dormancy and sprouts into a seedling. Plants may grow until maturity and which time they will flower. Flowers are the reproductive structure of a flowering plant. After pollination takes place in the flower, the sperm and ovum unite to produce seeds. Fruits are the ripened ovaries of a flowering plant and the way in which flowering plants disseminate their seeds. Seeds may travel by water, wind or by animals and are therefore deposited away from the parent plant, to begin the whole process once again. Plant lifecycles may occur in a year or one growing season. These plants are

called annuals. Plants which complete their lifecycles within 2 years are called biennials. Those that are longer lived are called perennials such as bushes and trees, which often produce flowers and fruits every year.

Vocabulary

Life cycle:	The series of developmental stages that a living organism passes during its lifespan.
Seed:	A small embryonic plant protected by a seed coat. Seeds are a plant's method and unit of reproduction.
Seedling:	A small plant which has sprouted from a seed.
Flower:	Plant part which makes the seeds and fruits needed for reproduction.
Fruit:	Plant part which contains the seeds.
Annual:	Plants which grow and reproduce in one growing season
Biennial:	Plants which grow and reproduce in two growing seasons, and usually reproduce in the second year.
Perennial:	Plants which grow for several years and reproduce once mature, often annually.

Materials

- Ziploc bags labeled with fruit and vegetables representing edible portions of plants including seeds, leaves, roots, flowers, stems and fruits (eg. Rice (seeds), lettuce (leaf) carrot (root), broccoli (flower)
- Bulletin board or large cardboard
- Push pins or thumbtacks
- Cards of common food plants with all stages of lifecycles (seed, plant, flower, fruit) eg. Corn, bean, pea, apple, pumpkin,
- Example of live bean plant with all stages of life cycle including seed, seedling, adult plant, flower, fruit.
- Acting props to act out life cycle of a bean plant (student's coats, paper flowers, paper leaves, fresh beans)
- Bee prop or puppet

Introductory Discussion

1. What are the stages in our lives, first we are a tiny egg, then we grow inside our mothers, then we are born, we grow into children, then adults etc. How about for plants? How do they start their lives? (Show example of seeds) What are the other stages of a plant's life? (Show example of a seedling) How do plants make more plants (reproduction)?

2. Some plants have very short lives and lifecycles and some have very long lives. Can you think of any plants that have a long life (Tree)? How about a plant that grows and dies in one year? (annual plants, eg. Lettuce, tomato).

Science Activity/Experiment

1. Each student will get a small Ziploc bag containing a different part of an edible plant. A chart will have various categories of edible plant parts in columns. Students must put their plant part under

the correct heading with a push pin. Eg. A bag of rice = seeds. Categories include root, leaf, stem, flower, fruit, seed. Allow students to guess, and then help direct them to the correct column, if necessary. Try to choose mostly foods that students are familiar with, and add a few rarer plant foods (lychee nuts, cinnamon sticks etc.)

2. Each table will have a set of cards with all stages of an edible plant (eg. Corn: seed, seedling, adult plant, flower and fruit). They will then put the stages in the correct order using a master sheet with the stages drawn on in a circle. Once a table has completed their card set, they may trade with another table for a new set of cards.

3. Using props, the students will act out the lifecycle of a bean plant. Wearing their coats, they will curl up on the carpet and act out the seed stage, slowly with the teacher using a watering can prop, they will be watered, and shed off their "seed coats". They will slowly crouch and then start to grow into a full-grown plant (using leaf props). Using paper flower props, they will "flower". One student will be a "bee" and pollenate. Then students will hold up bean props as fruit. Beans pods can be opened and new seeds will fall to the floor, to start the cycle again.

Closure Discussion

1. Are there any foods which surprised you when categorizing them? (Potatoes – always confuse students as they are actually underground stems!). Many vegetables are actually fruits if they contain seeds. Can you name a few vegetables that are actually fruits? What was easy to guess? What was hard?

2. Lifecycles game: which plants were easy to sort? Which were harder?

3. Did you learn anything new? What is a fruit? (Ripened ovaries of a flower) What part of the flower produces seeds? (Ovaries)

References:

Cruickshank, Susanne et al. Turning the Earth: A Month to Month Guide to Your School Garden. 2007. Vancouver School Board. Vancouver.

Hickman, Pamela and Heather Collins A Seeds Grow: My First Look at a Plant's Life Cycle. 1999. Kids Can Press. Toronto.

Ganeri, Anita. From Seed to Apple: How Living Things Grow. 2006. Heinemann Library. Chicago.

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Campbell, Neil, A. Biology. 1993. 3rd Edition. Benjamin/Cummings Publishing Co, Inc. Redwood City.