



Science Unit: *Soils, Plants, and First Nations*
Lesson 3: *Parts of a Flower and Pollination*

School year: 2007/2008
Developed for: Britannia Elementary School, Vancouver School District
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Grade level: Presented to grades 1, 2 and 3; appropriate for Grades 1 to 5.
Duration of lesson: 1 hour and 20 minutes

Objectives

1. Learn about the parts of a flower
2. Discover the process of pollination and its importance.

Background Information

Flowers are a part of many plants, and help ensure the plant reproduces. Flowers often contain both the male (pollen) and female (ovules) parts. The stamens are the male parts of the plant and contain pollen sacs which, when ripe burst open and release many tiny grains of pollen (male sex cells). The pistil is the female part of the plant and it contains the sticky stigma, which traps the pollen, and the ovary, which contains one or more ovules (female sex cells). After the pollen grain lands on the stigma, it grows a pollen tube which reaches the ovule. This is when fertilization takes place. The male and female sex cells together develop into seeds. Many flowers are brightly-coloured or have strong, sweet scents which attract insects and other animals for pollination. Pollination is the transfer of pollen from the male anther to the female stigma. This can occur in the same flower, but most often occurs between 2 different flowers of the same species. Pollinators are attracted to flowers as they contain stores of sugary nectar, which is an important food source for many insects and some birds (such as the hummingbird) and bats. Nectar is found in nectaries, which are small swellings at the base of the petals. Without pollinators, fertilization would not occur in many plant species and seeds and fruit would not form. We rely heavily on pollinators for many of our food crops, including most vegetables and fruits.

Vocabulary

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| <u>Flower:</u> | The reproductive structure of seed-bearing plants usually with the male, female or both sets of specialized organs, protected by sepals and petals. |
| <u>Pollination:</u> | The transfer of pollen from the anthers (male) to the stigma (female) in the same or different flowers. Pollination can occur by wind, insects, birds or bats. |
| <u>Sepals:</u> | The leaf-like structures, found at the base of flowers which protect the flower bud. |
| <u>Petals:</u> | The often showy, coloured leaf like parts of a flower, which protect the reproductive organs and attract pollinators. |
| <u>Anthers:</u> | The part of the male reproductive organ which contains the pollen sacs |
| <u>Stamens</u> | The male reproductive parts of a flower made up of the anther and the filament |
| <u>Pollen:</u> | The male sex cells contained in the pollen sacs of the anther |
| <u>Filament:</u> | The thin stalk, holding up the anther |
| <u>Style:</u> | The stalk of the pistil, connecting the ovary with the stigma. |



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| <u>Stigma</u> | The sticky tip of the pistil (female) which acts as a landing pad for the pollen grains |
| <u>Pistil:</u> | The female organ of a flower, including the stigma, style and ovary. |
| <u>Ovary</u> | The female reproductive organ in a plant, containing one more ovules. After fertilization the ovary will become the fruit. |
| <u>Ovule:</u> | The female sex cell, inside the ovary. After fertilization, the ovule will become a seed. |
| <u>Fruit:</u> | A developed ovary. Many fruits are edible such as plums, apples and cucumbers. |
| <u>Nectar:</u> | A sugary solution produced by flowers in the nectaries (at the base of the petals), which is an important source of food for bees, other insects, some birds and bats. |

Materials

- Flowers (one for each student) collected or purchased at a floral shop, grocery store or garden. Lilies and tulips work very well.
- Magnifying glasses
- Dissecting microscopes
- Sharp knife or razor blade (to be used by teacher only)
- Hand-drawn poster of the parts of a flower

Introductory Discussion

1. What are flowers for? How do plants reproduce or make new plants? Have you ever looked carefully inside a flower? What did you see? Have you ever seen a bee or a hummingbird visit a flower? What do you think they were doing? Were they eating/drinking anything? What do bees bring back to their hives to feed their young?

Review parts of a plant and their functions. Hand-draw or purchase a poster with the parts of a flower and go over the parts and their functions. For younger students simplify the activity by asking them to find fewer parts such as petals, sepals, stem, pistil, ovary, stamens and pollen.

Science Activity/Experiment

1. Hand out a flower to each student. Ask students to find a list of the flower parts (it can contain as many or as few items as is age-appropriate. Start with the sepals and petals. Count these and observe their colour, scent and texture.
2. Next let the students locate the stamens, often yellow, orange or black in colour. Count the stamens. Encourage students to put their finger on the anthers and see if they can get dusty pollen from it. Ask them to pull off a stamen and let them look at it under a dissecting microscope or with a magnifying glass. Try to locate the pollen.
3. Then let them locate the pistil and the stigma (the sticky pad which receives the pollen). Pull the pistil off the flower. With the help of an adult, slice the pistil open with a razor blade or very sharp knife and look for the ovary. This is best seen on mature flowers.
4. Draw a cross-section of the flower with all its parts. Label all the parts of the flower. Compare different flowers.

Closure Discussion

What did you learn about flowers? What is a flower's main job? Did everyone find the pollen? Pistil, petals, etc. Why are pollinators important to us? What important job do they do? Can you think of any plants that use wind to pollinate? (Think of many trees and grasses).



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References

- Ganeri, Anita. 1993. What's Inside Plants? Peter Bedrick Books. New York.
- Hickman, Pamela M. 1991. Plantwise. Federation of Ontario Naturalists. Kids Can Press. Toronto.
- Richardson, Joy. 1993. Flowers. Picture Science. Franklin Watts. Toronto.
- Burnie, David. 1989. Plant. Eyewitness Books. Dorling Kindersley. Stoddart Publishing. Toronto.

Extensions

1. Act out the parts of a flower, starting with the tallest student being the pistil, surrounded by 3-4 students being the stamens, with their hands in the air, gently waving them. Then 4-5 students can be the petals, holding hands and protecting the stamens and pistil. Finally, one student can be a bee, which comes to the flower to pollinate and drink nectar.
2. Go on a flower search on the school ground or neighbourhood. Take pipe cleaners and loop one end. Give each student a looped pipe cleaner and let them try to be a pollinator and collect pollen from a flower and then place in on the next flower.
3. Do celery and food colouring experiment
4. Take an educational field trip to Van Dusen Gardens.
5. Book a visit from High Touch High Tech "Smarty Plants" www.sciencemadefunbc.net

Parts of My Flower

Name _____ Date _____

Draw your flower and label its parts (sepal, petal, stamen, pistil, ovary).

What does the stamen contain? _____

Where do the seeds form? _____

What pollinates flowers? _____

My Celery Experiment

Name _____ Date _____

Draw and label what you did:

Draw what you saw (and label).

When you took out the celery and looked at it with the magnifying glass, what did you see? Draw and label.