



Science Unit: *Plants*
Lesson: 11 *Plant Collectors*

School Year: 2012/2013
Developed for: University Hill Elementary School, Vancouver School District
Developed by: Shona Ellis (scientist), Joan Phoenix and Andrea Morgan (teachers)
Grade level: Presented to grades 1 and 2; appropriate for grades 1 – 7 with age appropriate modifications.
Duration of lesson: One 2-hour session and two 1-hour sessions

Notes: The collection component of this activity can be combined with a longer field trip. This activity will teach students how to collect from nature responsibly (remember to get a permit if you are collecting in a park), the importance of pressed plant collections and why/how they are used by scientists. Students will learn how to take notes of the observations made in the field and how to make their own pressed plant collection. Contact the Metro Vancouver Regional Park Office to get a permit for collecting (phone: 604-224-5739).

Objectives

1. Explain why scientists collect plants.
2. Collect and document a plant collection (vascular plants).
3. Prepare a herbarium specimen (herbarium sheet with specimen label).
4. Make scientific observations, such as habitat, plant description (leaves, flowers, etc.), and the location of their specimen in their field journal.
5. Identify their specimens using books and online resources.

Background Information

Botanists press plants as a way to preserve them not only as a historic record, but also to learn more about their biology, diversity and distribution. Scientists have developed a system for preserving plant material, which they can later use to compare and identify plant species. Plant material is collected, flattened, dried and then mounted on a stiff sheet of paper, called herbarium paper. These specimens can then be stored for a long time in a plant library, called a herbarium, which scientists can use for research or teaching purposes.

Each specimen (voucher) in a collection has a corresponding herbarium label. Included on the label, are data from the collector, such as his/her name, collection date, location, habitat, the plant's name and characteristics.

Vocabulary

Biodiversity: A term used to describe the variety of living organisms within an ecosystem (pond, forest, etc.).

Botany (botanist): Botany is a branch of Biology that studies plants; a botanist is someone who studies plants.

Determiner: The person who identified the plants species name (may be the student or the teacher).



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- Habitat:** A type of environment or place where plants and animals naturally live.
- Herbarium:** A collection of pressed plant specimens that have been mounted on herbarium paper, identified and labelled with their scientific name along with descriptions for research or educational purposes.
- Plant specimen:** All or parts of a plant that is collected and preserved to represent a species or group of plants.
- Species:** The scientific name of an organism.

Materials (Field)

- Backpacks
- Boots
- Plastic bags for collecting
- Water
- Clipboards
- Pruning shears or scissors
- Snacks/Lunch
- Field journal
- Hand lenses
- Raingear
- Pencils
- Digital Camera

Materials (Pressing and Mounting Activities):

- Plant press (2 flat pieces of plywood (approx. 12" x 18"))
- Several pieces of corrugated cardboard (approx. 12" x 18")
- Several large pieces of thick paper (approx. 12" x 18")
- 2 luggage straps (or other cords for binding)
- Several sheets of newspaper
- paint brush
- waxed paper (or parchment paper for baking)
- specimen labels (see end)
- white glue
- large tray

In the Classroom

Introductory Discussion

Day 1: Collect specimens:

It is best to collect plant specimens on a dry day. Collect healthy specimens with reproductive structures, such as flowers, fruits, etc., as they can be very helpful for identification.

1. Students should note the habitat, location, and the description (leaves, flowers, fruits, etc.) of their specimen in their field journal prior to collecting a specimen. They can also make small drawings or pictures of key features.
2. The collected specimen is placed in a plastic bag and numbered. Students should also write the same number next to the plant's description in their field journal.



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3. Make sure students have collected sufficient plant material

Pressing the plant material (building a plant press):

The colour and shape of the plant specimen collected can be retained for a long time by pressing and drying the material. Press the specimens collected as soon as possible, as waiting too long could cause the plant material to wilt and lose its shape, especially on a warm day. If each student is collecting one plant then you can use one press for the entire class.

1. Place one piece of plywood on a flat surface. On top of it, place a piece of cardboard then an open sheet of newspaper.
2. Lay down one specimen between the newspaper sheets, making sure the structures (i.e. flowers, leaves, etc.) are clearly visible. Showing the top and bottom side of a structure, such as a leaf, provides information to a scientist. Place a piece of cardboard on top.
3. Continue stacking each plant material as follows: newspaper; plant; newspaper; cardboard.
4. Once you have layered all of the samples, place the second piece of plywood on top.
5. Tie everything together using the luggage belts (or other cording), and tighten as much as possible. You can also apply additional weight, such as books, to the top of the press.
6. Leave it for a week (or until specimens are dry) in a dry well-ventilated area.

Please see the diagram of the plant press at the end of this lesson plan.

Day 2

Label:

Students will prepare a herbarium label to include: the name of the plant; habitat description; locality; date the specimen was collected; names of the Collector and Determiner; and the collection number. Labels can be printed from a sheet at the end of this lesson plan.

Mounting:

Once the specimens have dried completely, they are ready to be mounted. Please see the figure at the end of this lesson plan showing the mounted plant and the placement of the herbarium label.

1. Fill in the herbarium label.
2. Students may need help with identifying their plant to species. Please see references at the end of the lesson plan.
3. Glue the herbarium label on the bottom right corner of herbarium paper (can use white glue or glue stick).
4. Dilute white glue with water (50/50) and pour a thin layer in the bottom of tray.
5. Dip the plant specimen in diluted glue and gently placed flat on the herbarium paper above the label.



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6. Arrange the plant so that structures (leaves, flowers, etc) are visible. They can also apply more glue under the plant parts if needed with a paintbrush.
7. Wax paper or parchment paper is then placed over the specimen and pressed again using the cardboard and plywood.
8. The luggage strap can be reapplied, but loosely.
9. Leave it until the glue is dry.
10. Check to make sure the plants are securely attached to the paper. Additional glue can be used. Small strips of adhesive tape can also be used (gummed linen tape or masking tape).

Closure Discussion

1. Why are plant collections important to understanding biodiversity?
2. Identify threats to biodiversity. [Not all are human (e.g. fire, disease, other natural events)]
3. What are some things you can do to reduce your impact to the environment?

References

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Pojar, J. and A. McKinnon 1994 Plants of Coastal British Columbia, B.C. Ministry of Forests and Lone Pine Publishing, Vancouver.

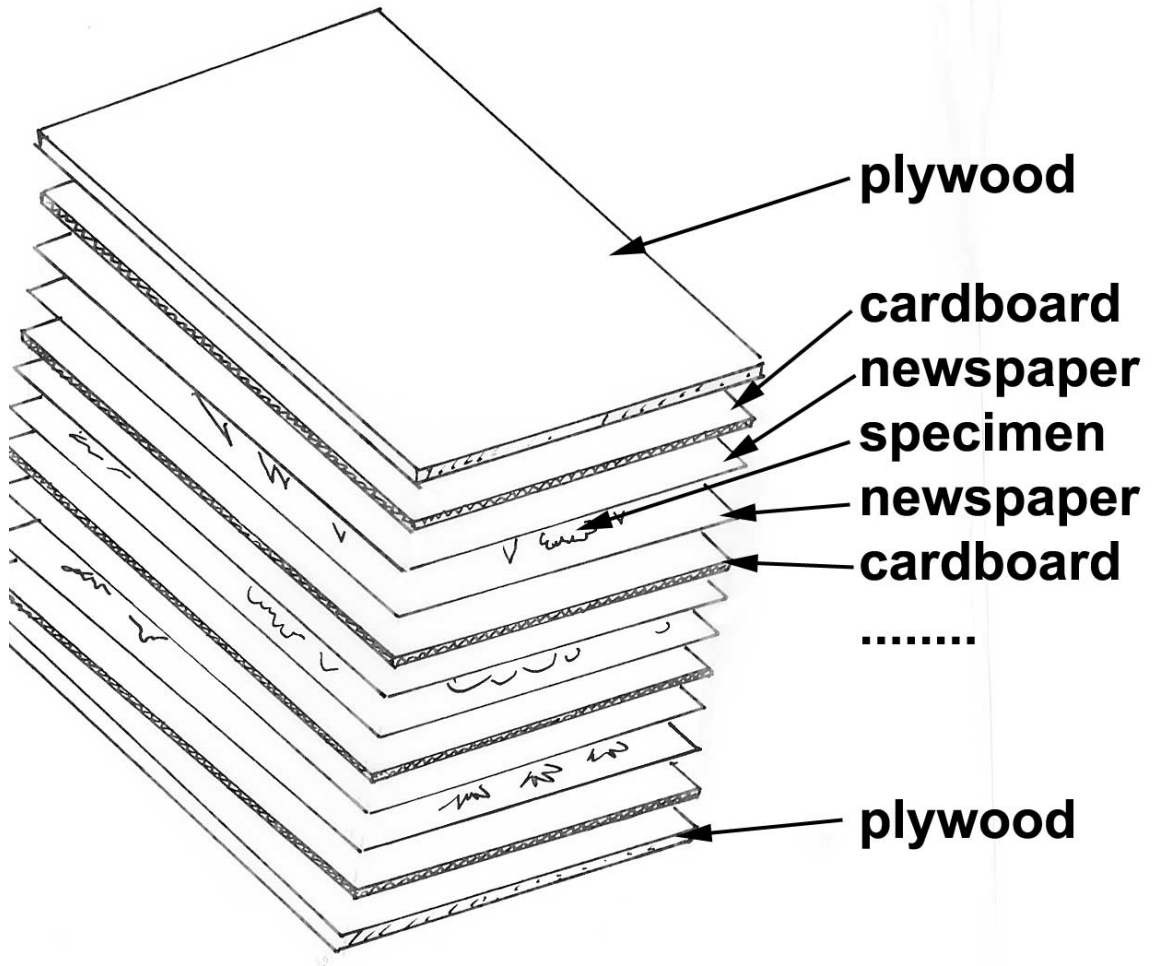
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Extension of Lesson Plan

1. Visit Beaty Biodiversity Centre (<http://beatymuseum.ubc.ca/schools>). If you are doing a tour, be sure to ask in advance to be shown the collections.
2. Have students start a herbarium collection for the school.



school: _____
VANCOUVER, B.C., CANADA

Common Name: _____

Scientific Name: _____

Habitat Description: _____

Locality: _____

Date Collected: _____

Name of Collector: _____

Name of Determiner: _____

Collection Number: _____

school: _____
VANCOUVER, B.C., CANADA

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