Science Unit: *Temperate Forest*

Lesson 20: *Uses of Forest Plants by Lower Mainland First Nations Peoples*

School Year:	2010/2011
Developed for:	Sir Guy Carleton Elementary School, Vancouver School District
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Grade level:	Presented to grade 4; appropriate for grades 2 – 7 with age appropriate modifications.
Duration of lesson:	2-3 hours (or the whole day)
Notes:	This activity is based on a fieldtrip to Pacific Spirit Park, but can be adjusted depending on the plant species present.

Objectives
By the end of this lesson, students will be able to:

1. Identify a number of forest plants used by First Peoples of coastal British Columbia.
2. Explain how different plants were used for different purposes by First Peoples of coastal British Columbia.
3. Identify the dominant trees of the forest (hemlock, Douglas-fir, western red cedar, big leaf maple) and the uses of bark and wood.
4. Explain the different uses of berry plants.
5. Explain the importance of storage technology for First Peoples.
6. Explain how plants were harvested by First Peoples.

Background Information

There is a long history of First Nations Peoples in the lower mainland of British Columbia. This Fieldtrip can be done in Pacific Spirit Park, which is the traditional territory of the Musqueam people (Coast Salish group).

Plants are essential for the life of humans. For the First Peoples of coastal B.C., plants were important for food, medicine, clothing, decoration, recreation, shelter, containers, tools for fishing, hunting, and food-gathering, cooking, heat, as well as for trade and spiritual activities. The First Peoples had an intimate association with nature and viewed themselves as part of the ecosystem. Nature was to be respected and preserved. Although I am writing in past tense, many First Peoples continue to have this relationship with plants and animals and view of their relationship with nature.

The following are themes that can be integrated into the lesson(s).

(a) Diversity of Plants as Food Sources

The First Peoples of coastal B.C. were hunter-gatherers; they gathered plants and hunted animals. They did not grow crops, although many groups did small-scale cultivation and there is evidence that their harvest techniques enhanced production of certain species. Many different plant parts were consumed. For example, students will find it interesting that the soft tissue to the inside of bark (cambium) of many conifer trees was eaten as were the leafy shoots of a number of plants including a number of familiar berry-producing plants.

(b) Cooking Methods

First peoples of BC had no metals or pottery so did not have pots to cook with. They roasted, used pits, and wooden boxes to cook their food. For more information on different ways of cooking and food preparation review Nancy Turner's book: Plant Technology of First Peoples in British Columbia.

(c) Importance of Storage

Food abundance varies throughout the year. For example, berries are available for relatively brief periods and the collection of roots may be optimum at particular times of the year. During the winter, food is often limited or unavailable. Food storage was very important for the First Peoples of coastal B.C.. Winters can be long so storing food that provides calories and nutrients would have been crucial for survival. For many foods drying and mixing with animal fats were involved in long-term storage.

(d) Plants in Technology

This is a very large category that encompasses non-food use of plants. Refer to Nancy Turner's Plant Technology of First Peoples in British Columbia for a comprehensive treatment. Lessons should include the use of wood for making different implements and tools. A previous discussion on everyday life will prepare students for discussions on how plants were used to construct the large structures such as long houses, totem poles, and canoes.

Vocabulary

Bark:	The outer layer of the stem and root of a tree (or woody shrub)
Caulking:	Sealing material used to fill gaps or seams
Conifer:	An evergreen tree that bears cones
Coniferous forest:	A forest in which conifers are dominant
Deciduous:	Trees which lose their leaves in the winter
Evergreen:	Trees which retain their leaves in the winter
First Nations:	Term used to refer to the Indigenous peoples (in Canada)
Gaffs:	Large hook used to land a large fish
Musqueam:	Coastal Salish Peoples whose traditional territories included the Fraser River estuary
Oolichan:	A small oily fish (also called candlefish)
Pitch:	Tree resin
Rhizome:	Underground stem
Shoot:	Stem with leaves
Temperate forest:	A forest that grows in regions with moderate temperatures

Materials:

- Backpacks
- Water
- Snacks/Lunch
- Raingear
- Boots
- Scavenger hunt lists
- Clipboards
- Notebook
- Pencils
- Digital camera
- Plant identification handouts

Introductory Discussion/Activity:

Preparation for this fieldtrip can be done a number of ways. It may be best to introduce the main plants students will see on the fieldtrip in advance. Activities to introduce background knowledge can include: classification, reproduction, plant structure, ecosystem dynamics, etc. An overview of First

Nations of North America would provide them with an understanding of the diversity of the First Peoples of the Continent and challenges that faced them.

This sample lesson is organized into stations where each plant is visited. Plant uses would be discussed either as review from previous classroom lessons and assignments or as observations and ideas based on what students already know about plants. Students can do a number of different activities ranging from drawing, writing, making bark rubs (depending on species), and making plant collections for pressing (with permission). A number of tree and plant guides are available for plant identification activities.

I. Berries

Common berry plants include:
Thimbleberry (*Rubus parviflorus*)
Huckleberry (*Vaccinium parviflorum*)
Salmonberry (*Rubus spectabilis*)

These plants produced fruits, which would be eaten fresh, or dried, sometimes mixed with oolichan grease and stored. Young shoots of thimbleberry and salmonberry were eaten like a vegetable (steamed or raw). The round fruit of huckleberry were used in fishing (look like fish eggs)

Comparisons can be made of the leaves (simple, lobed, compound). Leaves of thimbleberry (and to more limited extent salmonberry) were used to line baskets and to dry foods on. Large leaves from thimbleberry were made into temporary berry collecting baskets. This is a fun activity. The lower lobes of the leaf were overlapped and then pinned together with either a small stick or the leaf petiole. This made a bowl-shaped container.

II. Conifers:

1. Western Red Cedar *(Thuja plicata)*
- B.C.'s provincial tree!

Discussion of General Features:
- What type of plant? (conifer, evergreen)
- General structure: roots, stems, leaves (scales)
- Reproductive structures (there will be some seed cones to show them) – ask where pollen comes from (the smaller pollen cones may or may not be present depending on time of year).

Uses by First Peoples:
The red cedar has been called the "tree of life" by the First Nations for centuries. All parts of the tree were used to make clothes, shelter, medicines, art, and weapons. It is truly the "corner stone" of northwest coastal native culture. Totem poles and canoes were made from whole red cedar trunks. Sections of bark were removed from the tree without killing it in order to make clothing from the soft inner bark. Locally, baskets made from western red cedar bark by the Musqueam people have been found dating back as far as 3000 years ago.

Discussion: How the different components were harvested.

2. Western Hemlock (*Tsuga heterophylla*)
Contrast with western red cedar (has needles instead of scales, bark isn't fibrous)

Uses by First Peoples:
The wood was easy to carve so was used to make household utensils (spoons, dishes, etc.) as well as fishing hooks. Boughs were dipped into the ocean during herring spawning season to collect eggs. Hemlock bark was used as a tanning agent and to make red and black dyes to colour mountain goat wool and basket materials, and as a facial cosmetic and hair remover.

3. Douglas-fir (*Pseudotsuga menziesii*)
- Cones have bracts that are shaped like the rear-end of a mouse (lots of myths and stories about its origin).
- Bark is thick and craggy.

Uses by First Peoples:
The wood is strong and heavy so was used to make a number of tools including spear handles, harpoon barbs, fire tongs, salmon weirs, caskets and halibut and cod hooks. The wood and bark made excellent fuel. Pitch (which is often oozing from the bark) does not dissolve in water so was used to seal joints of harpoon heads, gaffs and fishhooks as well as for caulking in canoes and water vessels. It was also used to make a medicinal salve for wounds and skin irritations as well as chewing gum.

Activity – Which terms apply to the tree? This can be done in a worksheet or as a Q and A.
(e.g. Douglas-fir)

Bark – yes and very thick and craggy
Scale leaves – no (not like the red cedar)
Broad leaves – no…they are long and narrow
Deciduous – no, doesn't lose leaves, keeps leaves all year round
Evergreen – yes, keeps leaves all year round.
Conifer – yes, "cone"-ifer
Flowering – no….it makes cones
Needles – yes, long pointy leaves
Fruit – no, remember fruit comes from an ovary which is part of a flower…..conifers do not have flowers and therefore no ovary.
Spores – for our purposes…..no, as we are contrasting with ferns, but if students go on to study plants they will find out that all land plants produce spores
Tree – yes, it is tall with one primary stem.

Contrast the cones, bark, leaves of the different conifers (important in identification)

III. Flowering Trees (angiosperms)
Bigleaf Maple *(Acer macrophyllum)*
Deciduous flowering plant; write down observations.

Uses by First Peoples:
It was called paddle tree in many languages as it was used to make canoe paddles. It was also used to make spindle whorls as well as to carve many other items including dishes, spoons, combs, and fish lures. The leaves had similar uses as those of thimbleberry discussed above. Its wood was considered an excellent fuel.

IV. Ferns
1. Licorice Fern (*Polypodium glycyrrhiza*)
Commonly growing on big-leaf maple
- Introduce fern structure: leaf (in ferns we call them fronds), rhizome (stem) lies along tree bark in a bed of moss.
- Fern can take hold by virtue of the moss mat on the tree (anchorage and maintains moisture).
- Called licorice root because of its licorice taste. It is very very sweet (chemical glycyrrhicin is much sweeter than sugar)

Uses by First Peoples:
It was used as a flavour (chewed on rhizomes, used to sweeten bitter medicines), also was an important medicine for colds and sore throat as well as an appetite stimulant.

2. Sword fern (*Polystichum munitum*)

- Evergreen
- Leaflets look like little swords
- Rhizome underground

Uses by First Peoples:
Rhizomes were harvested in spring and roasted or cooked in pits. They were peeled and often eaten with grease or dried salmon eggs. They were eaten to cure diarrhea (fern rhizomes seem to be constipating). Leaves were used to line steaming pits and storage vessels as well as for bedding.

Some coastal peoples played a game with the leaves. It was a contest to see who could pull off the most pinnae in a single breath. If you play this game do remove all of the leaves from one plant (also, if in a park, permission to remove plant parts should be attained).

3. Bracken Fern (*Pteridium aquilinum*)
- deciduous
- Each leaf is extremely large. It is compound with many leaflets. The stem is underground and out of sight.

Uses by First Peoples:
The rhizomes were harvested in fall or winter (in summer by some peoples). They were dried and cooked in pit ovens/roasted and then the outer skin was removed. The starch rhizome was then eaten with fish eggs or oil or made into flour. The central fibres of the rhizome were removed and used as tinder for fires and as thread. The leaves were used to line steaming pits, cover berry baskets, bedding, and storing dried foods.

Students may be familiar with fiddleheads (young, round coiled leaves of ferns), but should be warned that they shouldn't be collected from the forest as they are toxic for most species. In fact, so are the rhizomes of ferns. This protects them from herbivores.

Closure Discussion

1. Why was it important for the First Nations People to understand the biology of plants? (Productivity of the plant is linked to developmental stages as well as time of the year.)

2. Not all food was collected locally. There was trade between different bands; for example, soapberry (Indian ice cream) grows in the interior so coastal people had to trade for it. What would they have used to trade with? (hint: location near ocean)? Some food was collected far from primary settlement. How would the First Peoples know when to go to harvest? (Local plant lore)

References

Canadian Studies program Canadian Heritage, Canada's First Peoples Before Contact http://firstpeoplesofcanada.com

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

Turner, N. J. 1998. Plant Technology of First Peoples in British Columbia. British Columbia Provincial Museum, Victoria

Turner, N. J. 1995. Food Plants of Coastal First Peoples. British Columbia Provincial Museum, Victoria

Extension of Lesson Plan

1. Students can draw pictures (or use diagrams made on the fieldtrip) and photographs to generate a class book. It could include traditional uses, uses today, plant facts and a “did you know” feature. This activity suggestion was inspired by “Traditional and Medicinal Plants in Ecole Puntledge Park’s Salmon Forest”, which is a booklet put together by the students of Ecole Puntledge Park School. Each student composed the content for a plant and illustrated it with their drawings.

2. This lesson emphasizes the importance of plants to the First Peoples of coastal B.C.; the dependence on animals was also great for food and other uses. Follow-up activities could include animal use as well as trade. The different ways of processing salmon and its use in trade would make a good lesson and may augment other activities.