Plants with a Purpose

(30 minute activity)

Objective

Students will be able to:

1) Illustrate the placement of riparian vs. upland plants
2) List plants that may be found at field trip site
3) Describe traditional medicinal uses of selected plants

Materials

- ❑ Plant photographs on compact disk
- ❑ Projector and screen or monitor
- ❑ Copies of *Plants in Transition* Worksheet
- ❑ Pencil

Background

A *riparian* area is an area of vegetation adjacent to and influenced by an intermittent or annual body of water. Riparian plants function to stabilize shorelines and streambanks adjacent to a body of water, provide food and cover to wildlife, and shade to keep the water temperature cool. As distance from a water body increases, plant demands for water decrease and ecosystems change. Upland plants have adapted in different ways to survive drier conditions. At the *Riparian Rx* station, students will be looking at adaptive and functional features that enable plants to exist in their environment.

Plants may serve a vast array of purposes. At this station, we will consider some uses of selected plants on our list by Native American groups who lived in the interior of Washington and British Columbia. This information is taken from work by a scientist in *ethnobotany*, who interviewed many Indian people still practicing traditional ways.

It is difficult for us to remember or even imagine how scarce manufactured items were to these peoples. If you could not produce it yourself or trade for it, you went without. This includes the most basic items that we barely consider in our lives; rope, string, nails and pegs, containers, aspirin, cloth, and shampoo. Getting away from the processed and packaged foods, plastic items and medicines of daily use we are accustomed to seeing, let us take an *ethnobotanical* view of the common plants that are all around us and consider their many uses. We will focus on plants that often occur in the riparian zone. These are plants found on both the student and teacher list.

Background continued

A word of caution!
The medicinal uses listed below are not recommended for use unless directed by a physician! Most traditional practitioners had years of experience and knowledge passed along by generations of practitioners before them. Often what is recorded by researchers is only a minimum amount of information. Also important is the place, time of year, harvest and storage methods, and final preparation of a plant. This information is being passed on to you as information only and as an illustration of how use of these plants was a critical element of a people s heritage.

Native American Beneficial Plant Uses

Grand Fir *(Abies grandis)*
The needles were boiled for medicinal tea, boughs used as air freshener and burned as incense, and needles dried and crushed for baby powder. The thin bark of young grand fir trees have pitch blisters. These blisters were pierced, and the pitch was collected for use as a medicine for consumption (tuberculosis) or appendicitis. The bark was powdered, dried, and rubbed on the skin as a deodorant. Dried and powdered needles were mixed with marrow from bones to make a hair dressing. Fresh boughs were used as floor coverings in sweat lodges.

Big Leaf Maple *(Acer macrophyllum)*
Uses such as tuberculosis remedy and dermatological aid.

Vine Maple *(Acer circinatum)*
Used as a love medicine.

Serviceberry *(Amelanchier alnifolia)*
The fruit of this shrub was highly prized. Berries are one of the early ripening fruits of the lowland and harvest could be extended into higher elevations as the summer progressed. Dried fruits were often mixed with dried bitterroot, salmon eggs, or with black tree moss, as well as eaten fresh. The berries were one of the sweetest foods available.

The burned ashes of the shrub were mixed with pine ashes to become a contraceptive. The branches were boiled for various medicinal uses such as treating colds and stomach problems.

The wood is hard and strong and provided arrows, digging sticks, spear shafts, tool handles, and seed beaters. Young branches were used as rope.

Oregon Grape *(Berberis nervosa)*
The tart berries were eaten fresh and dried.

The inner bark of the stems and roots produced a yellow dye used in coloring basket materials, mountain goat wool, and porcupine quills. The stems and roots were boiled until the water was almost all boiled away and a powdery yellow substance was left. This was mixed with ochre paint and the resin of cottonwood buds.

It was a multipurpose medicine, eye wash, tonic, and blood purifier. For some groups, the branches of Oregon grape also served ceremonial functions; they were placed in graves and around the walls and furniture.

Red Osier Dogwood *(Cornus stolonifera)*
This member of the dogwood family is also known as red willow since it adds a red color to the late winter landscape with its bare branches. The white, bitter berries were considered to be good eating because they gave extra sweetness to midsummer chokecherries and serviceberries. The inner bark, mixed with kinnikinnick or tobacco, became a smoking mixture.

The larger stems were used to make fish traps and spatulas and the large limbs made frame poles. The older branches created smoking fires for buckskin. The bark was stripped, twisted into rope and used for lashing together fish traps, raised food cache platforms, and other utilitarian uses. Powdered bark, mixed with cottonwood bud resin, made a red paint.

Medicinal uses of a tea made from the young twigs or the outer bark of this shrub were numerous and could be used for almost any kind of sickness. It clears the blood, helps circulation, and heals sores and rashes. A daily concoction for a year after childbirth prevented another pregnancy.

Horsetail *(Equisetum arvense)*
Numerous medicinal uses were identified such as a wash for skin sores, a tea for colds, and as a diuretic for the kidneys and backache.

Horsetail s primary use was as sandpaper, especially useful to polish bone tools and soapstone pipes and ornaments. Soapstone items were first covered with a varnish of warm salmon slime that was allowed to dry and harden, then rubbed with horsetail stems. Women polished their nails with the stems. The dark roots created patterns in woven baskets.

Ocean Spray *(Holodiscus discolor)*
Numerous medicinal purposes such as: antidiarrheal, eye medicine, cold remedy, disinfectant, and others. The dried and pulverized leaves healed sores.

Also known as ironwood. The wood of this shrub is very hard, especially when it is heated in a fire. It was used to make digging sticks (used mainly by women) for digging roots and bulbs of edible plants, arrows, fish-spear heads and teepee poles.

Engelmann Spruce (Picea *engelmannii)*
Spruce roots were sometimes substituted for the preferred cedar roots in the manufacture of basketry.

The needles produced a pleasant tea and a medicine for tuberculosis and respiratory ailments was created from the bark steeped in hot water.

Ponderosa Pine *(Pinus ponderosa)*
Medicinal uses were numerous. The pitch was mixed with grease and used as a skin lotion, the needles were brewed into a tea used to stop internal hemorrhaging, and used as an eye wash.

The inner cambium layer was harvested in the spring by prying a rectangular shaped slab of bark from the tree and scraping the moist cambium layer from that. The scars from this activity can be seen on living trees in some locations today. Sometimes the seeds were collected from cones in the fall and the hard, red pitch chewed as gum.

The heavy outer bark was saved and became a covering on winter houses (house pits), bent bark containers, and as trays and platters for serving food. Its wood and poles aided in general construction. The pitch was used as glue and as a caulking for canoes.

Black Cottonwood *(Populus trichocarpa)*
Used as a disinfectant, skin aid, and throat aid.

The black cottonwood tree is always an indicator of water and spotting it on the landscape was a welcome sight to people traveling in an arid land. The trunk of the tree was sometimes used to make a dugout canoe. The wood itself was very light when dry. Often the rotted, punky wood was used to smoke hides, imparting color and some waterproofing to them. The upper branches made fire drills and the roots were used as hearths for making friction fires. Cottonwood ashes became a soap to clean buckskin clothing and for washing hair.

The aromatic resin from the buds was used as a glue that was reputedly better than traditional fish slime glue for attaching arrow heads to arrows and spears.

Douglas-fir *(Pseudotsuga menziesii)*
Pitch made water jugs watertight and was chewed as a gum.

As in our modern society, Douglas-fir was a basic building material providing teepee poles, spears, shafts, and general use poles. Fresh boughs were used for bedding and were thought to be especially useful for purifying the households of people who were in mourning.

A special product of these trees was produced in hot, dry weather when certain compounds crystallized on the needles into a sweet sugar-like substance.

Medicines for colds, stomach problems, anemia, fever, and loss of energy and weight was made by making a tea from the first year s needle growth.

Woods Rose *(Rosa woodsii)*
The outer rind of the fruits were eaten, although they were not highly favored. They had the advantage of being available in the winter if food stores were low. Camas and bitterroot were flavored while they cooked with rose leaves.

Rose leaves, chewed and applied to bee stings, reduced the swelling and discomfort. A tea made of the rose stem and poured over a hunter s body was said to reduce or eliminate the human odor and contribute to the success of the hunt.

Thimbleberry *(Rubus parviflorus)*
Fruit was eaten fresh, pressed into cakes and sometimes dried. Tender shoots were eaten in the spring. The large leaves were used to line steam — cooking pits or ovens or to line berry picking baskets.

The roots were used to make a facial wash for the control of pimples and blackheads and as a medicine for stomach problems.

Coyote Willow *(Salix exigua)*

Used for basket making, building shelters, roof thatching and other household related uses.

Willow leaf tea was used to treat many diseases and health ailments. Chemical analysis has shown that the salicylic acid contains the same active ingredient as in aspirin.

However, this is a perfect example of how an herbal chemical can vary depending upon which part of the plant is harvested, and how the material is stored.

Young willow shoots can be stripped of their bark and eaten. The inner bark was eaten raw, eaten like spaghetti, or made into flour.

Solomon s Seal *(Smilacina stellata)*
The roots of this plant were said to taste like onions, were used to flavor other foods, or were eaten green by themselves.

A medicine for colds or lack of appetite was made from the boiled roots.

Snowberry *(Symphoricarpos albus)*
The white berries were considered poisonous and not consumed.

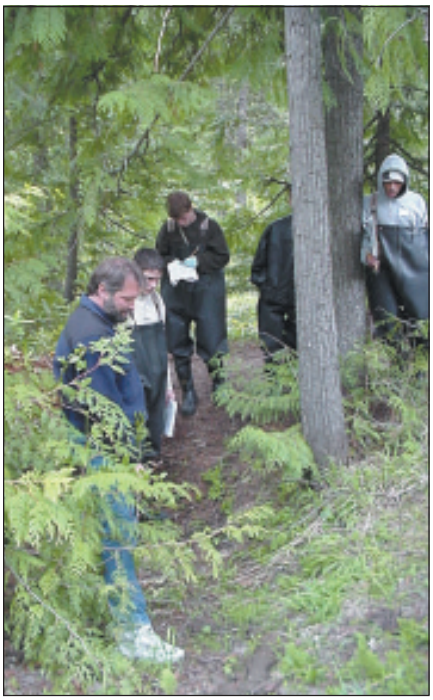
The entire plant was boiled and the resulting brew was used as a physic to clean out the system. The mashed berries were used as a poultice on skin sores or to relieve itching. The mashed berries were put into the eyes to relieve sores or rubbed in the arm pits as an antiperspirant.

Western Red Cedar *(Thuja plicata)*
The cedar tree was one of the most prized and versatile of the tree resources. In the dry interior, it is confined to the riparian areas in the mountains and foothills. It was valued for housing, boxes and canoe construction. The wood was easily split and often planks were split from a living tree. The bark was peeled off the tree in long strips or cut into rectangular slabs. The inner layer once removed, was used for a myriad of items that included basketry, skirts, capes and complete dresses. The small roots were dug up, split, and used for basketry and ropes.

The cambium was eaten fresh in the spring and dried for later use.

Many medicinal uses were reported such as an analgesic, heart medicine, toothache remedy, kidney aid, hair rinse, and dandruff wash. Arthritis sufferers sometimes soaked in a cedar bough solution to ease their discomfort.

Procedure



1. Ask questions to assess knowledge of plants such as:
   - ❑ What are some typical plant species found in this area?
   - ❑ Where do they grow? Consider aspect to the sun, elevation, water access.
   - ❑ What do plants contribute to the ecosystem? (e.g., food, soil and bank stabilization, cover, oxygen, filtering, and flood control as in wetlands.)
   - ❑ What beneficial uses do plants have to humans? To animals?
2. Show photos from this section. Ask students to name what plants they know, but do not discuss where they grow.
3. Ask students to complete *Plants in Transition* Worksheet.
4. Present photos again and ask students to compare answers with those you provide. Discuss *adaptations* and functional differences of the various species. Continue the discussion with samples of local plants (only if they are abundant in the area) or take a walk outside. Point out physical characteristics that exemplify riparian, transitional, or upland plants.
5. Discuss the human uses of plants.
   Ask students to create a handbook based on the plants listed in the *Native American Beneficial Plant Uses* Section. Illustrate each plant in its common habitat, describe how animals and humans use it, and list its benefits to the ecosystem.

Assessment

Ask students to:

- ❑ Illustrate plants on the list, emphasizing adaptive features; use field guides as needed.
- ❑ Explain the functions of riparian plants and how they contribute to the ecosystem.
- ❑ Name other vegetation that grows in the same communities as the plants from the photos.
- ❑ Discuss pertinent answers on the *Kids in the Creek Scavenger Hunt*.

Extensions

- ❑ Locate outdated aerial photos from your nearest U.S. Forest Service. Ask students to locate the riparian areas and predict which plants might be found there.
- ❑ Practice using a dichotomous plant key for identification, starting with tree species in the schoolyard.
- ❑ Assign students to start a journal of local riparian plant species, drawing and noting features for future identification needs.
- ❑ Visit a nearby waterway and note riparian, transition and upland plants. Are they similar or different to those discussed in class?

Riparian Rx Photos (Teacher s List)
Remember plants are found where the water delivery system suits them. For example, vine maples need wet feet, yet may be found up hillsides when they would only be expected to grow in riparian areas. This may be due to either surface or subsurface water movement patterns. Photos provided include:

Botanical Name	Common Name	Riparian(R), Transitional(T), Upland(U)
1. Abies grandis, foliage	grand fir, foliage	T, U
2. Abies grandis, bark	grand fir, bark	T, U
3. Acer circinatum	vine maple	R, T, U
4. Acer macrophyllum	big leaf maple	R, T
5. Alnus sinuata	Sitka alder	R, T, U
6. Amelanchier alnifolia	serviceberry	R, T, U (Drought Resistant)
7. Berberis nervosa	Oregon grape	T, U (Drought Resistant)
8. Cornus stolonifera	red-osier dogwood	R
9. Equisetum spp.	horsetail	R, T (seeds? spores?)
10. Galium triflorum	sweet-scented bedstraw	R, T
11. Holodiscus discolor	ocean spray	R, T, U (Drought Resistant)
12. Pachystima myrsinites	mountain box	R, T, U (Drought Resistant)
13. Picea engelmannii, foliage	Engelmann spruce, foliage	T, U
14. Picea engelmannii, bark	Engelmann spruce, bark	T, U
15. Pinus ponderosa, foliage	Ponderosa pine, foliage	T, U (Drought Resistant)
16. Pinus ponderosa, bark	Ponderosa pine, bark	T, U (Drought Resistant)
17. Populus trichocarpa, foliage	black cottonwood, foliage	R
18. Populus trichocarpa, bark	black cottonwood, bark	R
19. Psuedotsuga menziesii, foliage	Douglas-fir, foliage	T, U
20. Psuedotsuga menziesii, bark	Douglas-fir, bark	T, U
21. Rosa woodsii	woods rose	R, T
22. Rubus parviflorus	thimbleberry	R, T, U
23. Salix spp.	willows	R
24. Smilacina stellata	starry Solomon-seal	R, T, U
25. Symphoricarpos albus	snowberry	R, T, U
26. Thuja plicata	western red cedar	R, T