

Montana Small Schools Alliance  
**HONORING MONTANA'S FIRST PEOPLES**

**UNIT:** Salish-Kootenai; Assiniboine-Gros Ventre - Plants/Science

**AUTHOR:** Shirley Peters, Cheryl Knuchel, Mark Morrison

**SCHOOL AND COUNTY:** Garrison School in Powell County

**GRADE LEVEL:** 3-6. The time frame for this spring unit is 7 days in 45 minutes to 1 hour blocks of time.

**INDIAN RESERVATION REFERENCED:** Fort Belknap

**SUBJECT AREAS:** This is primarily a science unit taught with a cross-curriculum of social studies and literature.

**PURPOSE:** In this cross curriculum unit on plants and flowers this unit will integrate the Salish-Kootenai, Assiniboine, and Gros Ventre uses of the bitterroot, serviceberry, huckleberry, camas, arrow-leafed balsamroot, bulrush, Indian hemp, buffaloberry, white sage, Indian breadroot, mint, and prairie sagewort.

**OBJECTIVES:**

1. Students will be able to identify parts of plants and flowers.
2. Students will be able to identify the twelve plants listed in the purpose.
3. Students will be able to identify the common uses of these plants.
4. Students will become aware of how important plants were and are to Native Americans.
5. Students will become aware of the importance of the Bitterroot to the American Indians in the state.
6. Students will research another native plant.

**CONTENT STANDARDS ADDRESSED:**

Science Standard 3: Demonstrate knowledge of characteristics, structures and functions of living things, the process and diversity of life, and how living organisms interact with each other and their environment. Benchmarks: 1, 3, 5.

Science Standard 5: Understand how scientific knowledge and technological developments impact society. Benchmarks: 1, 4.

Social Studies Standard 6: Demonstrate an understanding of the impact of human interaction and cultural diversity on societies. Benchmarks: 1, 2, 4.

Literature Standard 4: Interact with print and non-print literary works from various cultures, ethnic groups, traditional and contemporary viewpoints written by both genders.

Literature Standard 5: Use literary works to enrich personal experience and to connect to the broader world of ideas, concepts, and issues.

### **ESSENTIAL UNDERSTANDINGS ABOUT MONTANA INDIANS:**

Essential Understanding 1: There is great diversity among the 12 Nations of Montana in their languages, cultures, histories and governments. Each Nation has a distinct and unique cultural heritage that contributes to modern Montana.

Essential Understanding 3: The ideologies of Native traditional beliefs and spirituality persist into modern day life as tribal cultures, traditions and languages are still practiced by many American Indian people and are incorporated into how tribes govern and manage their affairs.

Additionally, each tribe has its own oral history beginning with their origins that are as valid as written histories. These histories pre-date the “discovery” of North America.

## **RESOURCES:**

Bates, Ramona. Flowers&Seeds (Grades K-2). Greensboro, NC: Carson-Dellosa Publishing Company, Inc., 1994

Bates, Ramona. Flowers&Seeds (Grades 4 -6). Greensboro, NC: Carson-Dellosa Publishing Company, Inc., 1994

Hart, Jeff. Montana Native Plants and Early Peoples. Helena, MT: Montana Historical Society Press, 1996.

Phillips, H. Wayne. Plants of the Lewis and Clark Expedition. Missoula, MT: Mountain Press Publishing Company, 2003.

Phillips, H. Wayne. Northern Rocky Mountain Wildflowers. Helena, MT: Falcon Press.

Schiemann, Donald Anthony. Wildflowers Of Montana. Missoula, MT: Mountain Press Publishing Company, 2005.

USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 5 June 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

The Story of the Bitterroot: a cross cultural odyssey of discovery. DVD. Looking Glass Films, 2004. 68min.

DVD online—<http://www.cskt.org/> Seasons Project

## Picture References

### **Bitterroot:**

[www.rainbowpointlodge.com/images/photogallery/Bitterroot%20%20Flower.jpg](http://www.rainbowpointlodge.com/images/photogallery/Bitterroot%20%20Flower.jpg). April 25, 2006

<http://montana.plant-life.org>. April 25, 2006

[www.wildflowers-and-weeds.com](http://www.wildflowers-and-weeds.com). April 25, 2006

<http://50states.com/flower/montana.htm>.

[http:// Montana.plant-life.org/species/lewis\\_rediv.htm](http://Montana.plant-life.org/species/lewis_rediv.htm)

### **Huckleberry:**

<http://visitmt.com/pictures/big/5473h.jpg>

<http://www.ag.uidaho.edu/sandpoint>. . April 25, 2006

### **Arrow-leafed Balsamroot:**

<http://www.naturalsciences.org/education/Yellowstone/images/images/balsamroot.jpg>.  
April 25, 2006

### **Camas**

[http://www.daytrails.com/Camas\(close\).jpg](http://www.daytrails.com/Camas(close).jpg) April 25, 2006

[http://www.fs.fed.us/r1/clearwater/LewisClark/lewis\\_clark\\_plants/images/Camassia\\_quamash.jpg](http://www.fs.fed.us/r1/clearwater/LewisClark/lewis_clark_plants/images/Camassia_quamash.jpg) April 25, 2006

[http://www.nsci.plu.edu/~jmain/Herbarium/pages/camassia\\_quamash\\_haitat\\_small.jpg](http://www.nsci.plu.edu/~jmain/Herbarium/pages/camassia_quamash_haitat_small.jpg)  
April 25, 2006

### **Serviceberry**

<http://www.tarleton.edu/~range/New%20Photo%20Slides/Photo%20Slides%201-137/common%20serviceberry%20fruits.jpg> April 25, 2006

### **Wild Mint**

[http://montana.plant-life.org/species/mentha\\_arven.htm](http://montana.plant-life.org/species/mentha_arven.htm) January 27, 2007

### **Buffaloberry**

<http://plants.usda.gov> January 28, 2007

[www.sd4history.com/unit2/lclesson3.htm](http://www.sd4history.com/unit2/lclesson3.htm) January 19, 2007

### **Indian Breadroot**

<http://www.lib.ksu.edu/wildflower/breadroot.html> January 28, 2007

<http://www.manataka.org/page827.html> January 28, 2007

### **Bullrush or Tule**

Picture of a tule tipi

[http://www.anamp.org/nescp\\_curriculum/illustr...](http://www.anamp.org/nescp_curriculum/illustr...)

<http://www.lib.ksu.edu/wildflower/softstembulrush.html> May 31, 2007

**Dogbane or Indian hemp**

<http://www.primitiveways.com/plants2.html/pages/Dogbane.htm> May 31, 2007

[http://en.wikipedia.org/wiki/Image:Apocynum\\_cannabinum.jpg](http://en.wikipedia.org/wiki/Image:Apocynum_cannabinum.jpg) May 31, 007

<http://www.lib.ksu.edu/wildflower/dogbane.html> May 31, 007

**White Sage:**

[http://plants.usda.gov/plantguide/doc/cs\\_arlu.doc](http://plants.usda.gov/plantguide/doc/cs_arlu.doc). January 28, 2007

**Sweetgrass:**

<http://plants.usda.gov/java/profile?symbol=HIOD>. January 28, 2007

**Prairie Sagewort:**

[http://plants.usda.gov/plantguide/doc/cs\\_arfr4.doc](http://plants.usda.gov/plantguide/doc/cs_arfr4.doc). January 28, 2007

**General food information**

<http://www.npss.sk.ca/np-and-you.html> January 19, 2007

## LESSON 1: Introduction

**Purpose:** To provide needed background information for this unit.

**Standards addressed:** 1. Social Studies Standard 6:  
    Benchmarks 1, 2, 4.  
2. Literature Standard 4

**Materials:** Map of Montana Indian Reservations (<http://www.hedgesoutdoors.com/images2006/mtres.gif> ), postcard or picture of a bitterroot flower, bitterroot legend (Title 1 on the DVD)

**Procedure:** 1. Each student has a map of the Montana with the Indian Reservations listed. They are introduced to all of the reservations paying special attention to the Flathead Reservation (Confederated Salish-Kootenai tribes) and the Fort Belknap Reservation (Gros Ventre and Assiniboine tribes)

2. Students listen to the bitterroot story.

**Evaluation:** In their own words, students will summarize the bitterroot story.

## Lesson 1

### Teachers Notes

If the DVD, *The Story of the Bitterroot: A Cross Cultural Odyssey of Discovery* is not available. There is a version of the Bitterroot Legend in the book, *Native Plants and Early Peoples*, pages 96-97

#### *The Arrival of the Bitterroot*

Long ago, as the story goes, The people were experiencing a famine. One old woman had no meat or fish to feed her sons. All they had to eat were shoots of balsamroot, and even those were old and woody. Believing that her sons were slowly starving to death, she went down to the river early one morning to weep alone and sing a death song. The sun, rising above the eastern mountains, heard the woman singing. Taking pity on the woman, the sun sent a guardian spirit in the form of a red bird to comfort her with food and beauty. The bird flew to the old, gray-haired woman and spoke softly.

“ A new plant will be formed,” said the bird, “from your sorrowful tears which have fallen into the soil. Its flower will have the rose of my wing feathers and the white of your hair. It will have leaves close to the ground. Your people will eat the roots of this plant. Though it will be bitter from your sorrow, it will be good for them. When they see these flowers they will say, ‘Here is the silver of our mother’s hair upon the ground and the rose from the wings of the spirit bird. Our mother’s tears of bitterness have given us food.’”

(There are also other versions of this story)

## LESSON 2: Importance of Plants

**Standard addressed:** Science Standard 3: Benchmarks 1, 3, 5.

**Purpose:** The purpose of this lesson is to show the importance of plants.

**Materials:** Bulletin board, poster board, markers, Large oval cutouts for making the web, white construction paper

**Procedure:** Brainstorm the importance of plants. Students will enter their ideas on the web in their booklet. The teacher and students construct a bulletin board. The bulletin board can be added to throughout the unit as new information is learned and pictures are collected.

**Evaluation:** Students will quiz each other on the uses of plants and then draw the uses on a sheet of white construction paper.

Caution: Students should not collect plants. Plants are very powerful. They often have poisonous twins. Great care should be taken in any use of native plants. Chokecherry pits have a strong toxin and should not be eaten fresh, however, when processed correctly, they may be edible.

## **LESSON 3: Identification of Plant and Flower Parts**

**Standard addressed:** Science 3: Benchmarks 1, 3, 5.

**Purpose:** Students will identify parts of a plant and flower through dissection.

**Materials:** Plants or pictures of plants. Handouts of flower parts, large flower such as tulip, daffodil, day lily, or carnation, tweezers, meat tray, hand lens, utility knife for teacher, glue, construction paper to mount the flower parts on.

**Procedure:** The teacher will show a plant and have the students identify the parts of a plant. Then they will discuss the different parts that make up a flower using the photo provided or a drawing of a flower. After the discussion, each student will be given a flower to dissect (this could be done in pairs). The teacher will make a slit in the sepal so the flower can be dissected and labeled. Use the plant parts sheets from the web to reinforce the parts of a plant.

**Evaluation:** Check to see that the students have labeled the parts of their flower correctly. Have the students complete the written quiz from the Primary Resources web site.

## **LESSON 4: Review and introduce the word ‘fruit’**

**Standard to be addressed:** Science Standard 3: Benchmarks 1,3,5.

**Purpose:** This lesson will review the flower parts using worksheets and introduce the word “fruit”.

**Materials:** Teacher’s guide from Carson-Dellosa “Flowers and Seeds”/ or a generic text, apple for a pair of students, utility knife for teacher, meat tray, straight pins, labels.

**Procedure:**

1. Give students 10-15 minutes to complete and review the worksheet.
2. Give each pair of students a cross section of an apple—have them label each part.
3. The teacher can cut a longitudinal section to show the parts from a different perspective.

**Evaluation:** Worksheet # 28 from Carson-Dellosa or check to see that the students have labeled the fruit correctly.

### **Labels for Fruit Dissection**

1. sepal
2. epidermis
3. Seeds
4. Carpellary tissue
5. peduncle

## LESSON 5: The Bitterroot

**Standards addressed:** 1. Science Standard 3: Benchmarks 1, 3, 5  
2. Science Standard 5: Benchmarks 1, 4.  
3. Social Studies Standard 6: Benchmarks 1, 2, 4.  
4. Literature Standards 4, 5

**Purpose:** Transfer knowledge of flowers to the bitterroot and show the importance of this plant to the Salish-Kootenai cultures.

**Materials:** postcard/picture of bitterroot, "Story of the Bitterroot"-DVD, worksheet, white drawing paper

**Procedure:** 1. Review the map of the reservations  
2. Have students draw and label the parts of a bitterroot flower.  
3. Students will watch and listen to the video of "The Story of the Bitterroot" clips 4,6,8,9.  
4. If this DVD is not available, research the bitterroot flower.

**Evaluation:** Quiz on the video clips.

Titles used from, *The Story of the Bitterroot: A cross cultural odyssey of discovery:*

Title 4: Botany

Title 6: When We Were Children

Title 8: The Gathering

Title 9: The Future

## Lesson 6: Native Plants

- Standards Addressed:** 1. Science Standard 3  
2. Social Studies Standard 6  
3. Literature Standard 4, 5

**Purpose:** Students will identify huckleberry, serviceberry, arrow-leafed balsamroot, camas, bulrush, Indian hemp, buffaloberry, white sage, Indian breadroot, mint, prairie sagewort and will become familiar with their uses and stories.

- Materials:**
1. Field guides
  2. Encyclopedia and Internet searches
  3. *Montana Native Plants and Early Peoples*
  4. Pictures of plants (huckleberry, serviceberry, arrow-leafed balsamroot, camas, bulrush, Indian hemp, buffaloberry, white sage, Indian breadroot, mint, prairie sagewort)
  5. Common plant names and scientific names sheet. Teacher's background information

**Procedure:** Divide the students into groups. Assign each group one of the plants listed above. Groups of students research a specific plant and find its range/habitat, plant description, flower description and its use by the Indians. The students will provide an oral and written report on the plant they were assigned. The teacher can share the information provided about stories and uses if the students are not able to find the information in their research. (The stories and uses component of the unit is important and should be included)

**Evaluation:** Students will be expected to match the common name, the scientific name, and pictures of the plants introduced in class and the flowers reported on by individual student groups. They will also be expected to know the same information on the bitterroot flower.

## Teacher Information

This section is included for the teacher's information. If you choose to share this information with your students, it is important to emphasize that students should **NOT** try these plants themselves. It is important to teach the ethical use of our outdoors and that it is important to not pick plants at random, but enjoy their beauty. Some of the plants discussed have religious significance to the different tribes. The sacred nature should be honored. Please check with the tribe for further information on individual plants.

The information in this section was taken from the field guides in the reference section, online research listed in the picture references, and from *Montana Native Plants and Early Peoples*. Longer sections are cited by author. In *Montana Native Plants and Early Peoples* there is an error in the author's use of Flathead Indians as a tribe. These people were probably the Bitterroot Salish or Pend d'Oreille Indians.

### **Plant: Globe Huckleberry** *Vaccinium globulare*

Range/ Habitat: Found in moist forests of the Rocky Mountains. It is found in montane and sub-alpine forests.

Description: The huckleberry is a small to medium sized shrub. It has shiny leaves that are 2.5 - 5 centimeters long and about 2.5 centimeters wide and rounded on the tips. It has horizontal rows of toothed leaves.

Flower: The huckleberry flower is a vase or urn shape, pink and hangs down from the axis of its leaves. It blooms in April through June. Flowers mature into a bluish- purple fruit.

Indians would travel to collect the fruit of the huckleberry. The fruit was eaten fresh or put out to dry for later use. The fruits were also formed into

loaves that were dried for storage. When they were ready to eat the fruit, the loaves were broken apart and boiled to eat with other roots.

**Plant: Western Serviceberry *Amelanchier alnifolia*  
Saskatoonberry, Sarviceberry**

Range/ Habitat: Found in open woods and stream areas. It is found in valleys to sub-alpine forests. It grows from northern California to Alaska. There are also eastern species.

Description: The serviceberry is a shrub that can be 1 - 10 meters tall. It has 2.5 - 5 centimeter leaves that are toothed along the upper half. It has soft silvery hairs on the lower surface of the leaf.

Flower: The serviceberry flowers are white with 5 long oval petals that are narrow at the base. There are 5-15 flowers on the ends of the twigs. It blooms in April through July. The flowers mature into a purple fruit.

Indians would gather the fruit and dry it as is or it pound into cakes for later use. These cakes or loaves could weigh as much as 15 pound according to the Lewis and Clark journals. The fruits were also pounded with meat to make pemmican. The berries were sometimes mixed with mint to discourage flies. The dried berries could be used with meat in stews or mixed with flour to make a pudding. The stems were also used for arrow shafts.

Serviceberry is also food for animals. It is used by people to make jams, jellies, pies, and wine. The berries can also be used like blueberries and huckleberries in baked goods.

**Plant: Arrow-leaved Balsamroot *Balsamorhiza sagittata***

Range/ Habitat: Arrow-leaved balsamroot is found in dry grasslands, in valleys, and hillsides in western North America.

Description: The arrow-leaved balsamroot has long arrow shaped leaves that come from the base of the plant. The leaves can be 20 - 30 centimeters long and 10 – 15 centimeters wide. The plant is 20 - 90 centimeters tall. They have a grayish appearance because of the hairs on the leaves.

Flower: The flowers are yellow and look like a sunflower. The plant is 10 to 15 centimeters wide, and has 8-25 ray flowers that are 2.5 – 5 centimeters long.

The Salish, Pend d' Oreille and Kootenai ate the peeled stalks of the plant like celery. The seeds were roasted and eaten or ground into flour. The roots were baked in a fire pit like camas roots for several days to make them easier to eat.

## **Plant: Bulrush or Tule *Scirpus tabernaemontani***

Range/ Habitat: The bulrush or tule is found in every state in the United States. It is found in wet areas, along streams, ponds and lakes.

Description: The bulrush is a sedge that can be 1 to 3 meters tall. It has a tall stem and long narrow leaves.

Flower: The bulrush has spikelets that are brownish colored. They do not have petals or sepals. They flower from May to June.

The Bulrush or Tule is a riparian plant that has many uses and has been used by Indian tribes for thousands of years. The slow water flow of wetlands support the growth of Bulrush that can reach the height of 7 feet tall or more. It is an excellent material used to shelter people from the rain, snow and wind. It is the most traditional shelter cover and may predate the hide teepee. Tule mats sewed together by Dogbane or Indian Hemp cordage (another important riparian plant) were layered on a frame of

teepee poles and used year around. Bulrush were also used extensively for mats to eat and sleep on, and to make baskets for harvesting plants and food storage. The young shoots in spring can be used for food. The Bulrush can also be used to make a boat like canoe. This plant was plentiful since the last ice age that produced numerous wetlands but now has decreased as the wetlands of our environment are decreasing. It is a most important plant material that has traditional uses by the tribes and should be protected as part of the American Indian heritage.

(Tim Ryan/AST)

## **Plant: Camas** *Camassia quamash*

**Range/ Habitat:** Camas is found in moist meadows in valleys to sub alpine forests.

**Description:** The camas plant is 30 - 60 centimeters tall. The leaves come out from the bulb. They are thin and almost as long as the stem.

**Flower:** The camas flower is purple to a pale blue color. Each flower has 6 stamens and a single style.

The camas was a very important food for the Indians in the west. It provided a very nutritious food source. It was also a trade item between tribes. They would collect the bulbs in the early summer. (Note: these did not happen at the same time, and the ceremonial aspect is discouraged as a school conversation.)

Elk antlers and sticks were used to dig the roots. The roots were steamed and then baked in an underground pit for 3 days. Sometimes the bulbs were dried for up to a week and stored for future use. The bulbs were also boiled and stored in bags.

The CSKT Seasons Project includes a good discussion of the processes used to gather and prepare camas. (<http://www.cskt.org>) Available 6/30/07  
Community members each had specific duties and responsibilities in harvesting, baking, and the community feast.

**Plant: Buffaloberry** *Shepherdia argentea*

Range/ Habitat: Valleys to subalpine forests. They are found in moist areas along streams and rivers.

Description: The buffaloberry is a bright red fruit that is found on a thorny silvery shrub. The shrub can be 20 feet tall. It has scaly silvery leaves that are  $\frac{3}{4}$  to 2 inches long. The flowers are small and a yellow color. The buffalo berry plant is either male or female. The male produces the pollen and the female produces the fruit.

The Indians collected the fruit in the fall by picking them or hitting the bushes with sticks. The berries beaten off the bush would fall onto a canvas or hide that was placed on the ground. The berries were eaten, or made into sauce to eat with buffalo meat. Sometimes the berries were also crushed before drying. Buffaloberries can be made into jams and jellies.

**Plant: Indian Breadroot** *Psoralea esculenta*

Indian Turnip, pomme blanche

Range/ Habitat: The breadroot is found on the prairies from Canada to Missouri, Texas, and eastern Colorado

Description: The breadroot is a perennial plant that has a very deep root. The roots can be 4 inches long. The stems are four to twelve inches long.

Flower: The breadroot has blue flowers and the flowers mature into pods.

Indian breadroot was a widely used root food. It was occasionally eaten raw, but usually it was roasted before it was eaten. The roots were also boiled and could be dried for storage. The roots were braided together and hung to dry. The dried roots were mashed and used during the winter months to “thicken soups, to make mush or gruel, and to prepare cakes and breads which were baked over coals”. (Hart 125) The roots are very nourishing.

## **Plant: Mint** *Mentha arvensis*

Range/Habitat: Mint can be found throughout the northern hemisphere. It is found around rivers and streams or where there is damp soil. It is found throughout Montana.

Description: Mint can grow up to 1 meter tall. It is a perennial plant that spreads from rootstocks. It has fine toothed leaves and is on a square stock. It blooms in July and August. The flowers are light blue to pink.

Mint has been used for thousands of years as a medicinal plant. It was used as flavoring and also as perfume.

**Horsemint** *Monardafistulosa* was also used by Indians for tea and chewed on for controlling insects.

## **Plant: Prairie Sagewort** *Artemisia frigida*

Range/Habitat: Prairie Sagewort is found from western Minnesota, southwest to eastern Colorado and from Wisconsin, north to British Columbia, Alaska, and Siberia and south to Arizona and northern New Mexico. Prairie sagewort grows in the open high plains, prairies, and semi-disturbed sites. Most of the wild sages are abundant in their natural habitats.

Description: Prairie sagewort is a spreading shrublet 1-4 dm (3.9-15.7 in) tall, pleasantly fragrant, whitish or grayish tomentose (dense, velvety, fuzzy hairs), and arises from a tough, woody crown. The leaves are also tomentose and abundant, clustered toward the base and scattered along the stem.

Flower: Prairie sagewort flowers from July to August. The fruits are smooth, broadly cylindrical achenes.

The Cheyenne used prairie sagewort ceremonially as a smudge for purification in the Sun Dance. The Delaware-Okla chewed the leaves as a ceremonial medicine. The Blackfeet chewed the leaves of prairie sagewort for heartburn and applied the leaves to wounds to reduce swelling. Prairie sagewort was also used to treat nosebleed by stuffing the nose with the soft leaves. The roots and tops were boiled and drank as a tea for "mountain fever." Other tribes, who used this species of sage include the Arapaho, Comanche, Gros Ventre, Cree, Navaho, Tewa, and Ute.

Natives gathered the plant for a variety of uses. Different people used different parts of the plant in a variety of ways. The plant was widely scattered throughout Montana.

### **Plant: Sweetgrass** *Hierochloa*

Range/Habitat: Sweetgrass is native to cool regions of North America. It grows in wet meadows, low prairies, and the edges of sloughs and marshes in Minnesota, North Dakota, Montana, and northwest Iowa.

Description: Sweetgrass is a fragrant perennial grass that reaches a height of 30 inches. The stems are hollow and hairless with open sheaths. The leaf blades are flat at maturity, 10 to 30 centimeters long. The lower branches are drooping and spreading.

Flower: The spikelets are three-flowered. Sweetgrass is an early blooming plant and flowers from May to July.

Sweetgrass is used ceremonially throughout the country. It is called the "grass that never dies." It retains its fragrance and spirit even when it is cut and dried. It is often braided. It is often used for incense or smudge.

### **Plant: White Sage** *Artemisia ludoviciana*

Range/Habitat: White sage occurs from east of the Cascade Mountains in Washington and Oregon, in California, north to eastern Canada, south to Texas and northern Mexico, and in Montana, Utah, Colorado, and in the Great Plains states. White sage grows in riparian areas along both

perennial and intermittent streams, in the sagebrush steppe, in both shortgrass and tallgrass prairies, and in semi-disturbed sites. It grows on dry, sandy to rocky soils below 3500 m.

Description: White sage is a white-woolly, perennial herb 3-7 dm (1-2 1/4ft) tall, with a strong odor of sagebrush. The stems are erect and often clustered. The leaves are alternate, entire to irregularly toothed or lobed, 3-11 cm (1.25 - 4.5 in) long, up to 1.5 cm (9/16 in) wide.

Flower: White sage flowers from August through September. The fruits are dry, smooth and broadly cylindrical. White sage and other *Artemisia* species can be propagated by seeds, by division of the rootstock, or by cuttings taken in the early summer.

Plant Uses: Burning white sage and “smudge sticks” (the process of harvesting sage stems and tying the stem together into a “smudge stick”), was and is used for cleansing and purification.

### **Plant: Dogbane or Indian hemp *Apocynum cannabinum***

Range/Habitat: The Indian hemp grows throughout the United States and southern Canada. It grows in open wooded areas, ditches, and hillsides.

Description: **It is a poisonous plant.** The stems are reddish. The leaves are 7-15 cm long and 3-5 cm wide. It can grow up to 2 meters tall.

Flower: The flowers are pinkish white. They bloom in mid summer.

Indian hemp was used for making twine and to sew the tule tipi.

## Pemmican

An extension of this unit would be to make pemmican. There are recipes available on the Internet. One web site that has many recipes and links to other sites is [www.geocities.com/Yosemite/cabin/3067/Pemmican.html](http://www.geocities.com/Yosemite/cabin/3067/Pemmican.html)

We were told that you can pound the meat using a pillow case and the dried meat. The recipe that follows was one used at The Montana Historical Society Museum in September 2006.

## Pemmican

### Ingredients:

- 1 cup Jerky (beef, bison, deer, elk or moose will all work)
- 1 cup Tallow (rendered beef fat), lard (rendered pork fat) or butter
- ¼ cup Fruit (blueberries, huckleberries, raisins, or if you use chokecherries, take out the pits).

### What else you will need:

- |              |                                   |
|--------------|-----------------------------------|
| Wax paper    | Food processor or grinding stones |
| Baking sheet | Oven                              |
| Saucepan     | Heat resistant bowl and spoon     |

### Procedure:

1. Preheat the oven to 200 degrees.
2. In a saucepan, melt the fat over low heat.
3. Grind the jerky in a food processor, stones, or mortar and pestle until finely shredded, then transfer into a heat resistant bowl.
4. Add berries, you may grind them too if you wish.
5. Allow the melted fat to cool a little then add it to the meat and fruit mixture.
6. Spread mixture onto wax paper lined baking sheet.
7. Bake in the oven about 2 hours. When cool, cut and eat.

## EXTENSIONS OF THE UNIT:

1. Art: Create a paper flower including the flower parts they have learned.
2. Art: Water color of bitterroot or camas.
3. Art: Use the apple pieces that were dissected to make apple prints on paper using tempera paint.
4. Writing: Create a story and drawing about the plant/flower researched.
5. Make some type of berry jam.
6. Dissect a bulb. Compare a regular daffodil bulb with a camas bulb. *The Bulbs: Camas and Daffodil* by Evelyn Carter, D' Lisa Pinkham, Jackie Taylor. Nez Perce Indian Reservation, Lapwai, Idaho. This lesson is found in *NASA Native Earth System Science Curriculum Project*.  
<http://www.skc.edu/Programs-IMSI-K-12Programs-NESCP>

**Labels for Plant Identification**

**Western Serviceberry (sarvisberry)**

*Amelanchier alnifolia* Nutt.ex Roem

**Bulrush / Tule**

*Scirpus tabernaemontani* K.C.Gmel.

**Globe Huckleberry**

*Vaccinium globulare* Rydb.

**Bitterroot**

*Lewisia redivivia* Pursh

**Arrow-leaved Balsamroot**

*Balsamorhiza sagittata* (Pursh) Nutt.

**Camas**

*Camassia quamash* (Pursh) Greene

**Buffaloberry**

*Shepherdia argentea* (Pursh) Nutt.

**White Sage**

*Artemisia ludoviciana* Nutt.

**Sweetgrass**

*Hierochloe hirta* (Schrank) Borbás

**Prairie Sagewort**

*Artemisia frigida* Willd.

**Indian Ice Cream, Canadian Buffaloberry**

*Shepherdia Canadensis* (L.) Nutt.

**Indian Breadroot**

*Psoralea esculenta* (Pursh)

**Mint**

*Mentha arvensis* L.

**Dogbane or Indian hemp**

*Apocynum cannabinum* L.

## Student Packet List

1. Map of Montana Indian Reservations  
<http://www.hedgesoutdoors.com/images2006/mtres.gif>
2. Summarize the Bitterroot Legend worksheet
3. Importance of Plants web worksheet
4. Plant anatomy- ([www.urbanext.uiuc.edu](http://www.urbanext.uiuc.edu)) or your own diagram
5. Close up flower  
<http://personal.nbnet.nb.ca/trevgall/biology/flower.html>
6. Unlabeled flower  
[www.naturegrid.org.uk/qca/flowerwork.html](http://www.naturegrid.org.uk/qca/flowerwork.html)
7. Primary Resources - The Parts of a Flower worksheet  
[www.primaryresources.co.uk/science/flower.htm](http://www.primaryresources.co.uk/science/flower.htm)
8. Inside of Fruit worksheets ( Carson Dellosa pgs. 27 & 28 )
9. Quiz on DVD
10. Research paper guide

## **Bitterroot Legend**

**In your own words, retell the story of how the bitterroot flower came to be. Draw a picture to go along with your story.**

## QUIZ ON DVD

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**1. How did the Salish-Kootenai use the bitterroot?**

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**2. Why was the bitterroot important to them?**

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**3. Where does the bitterroot grow?**

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## **RESEARCH INFORMATION**

**NAME:** \_\_\_\_\_

**DATE** \_\_\_\_\_

- 1. Name of plant (common/ scientific/ Salish, Gros Ventre, Assiniboine)**
  
- 2. Habitat**
  
- 3. Range**
  
- 4. How does your plant grow (size, time of year, special features, etc.)?**
  
- 5. Description of your plant: sketch or photo or picture**
  
- 6. What are the uses of your plant?**
  
- 7. Is there a historical significance to your plant?**
  
- 8. Any other interesting or important facts that you want to remember.**

Land Benefits

Tools/Technology/  
Utility

Clothing

Beauty

Personal hygiene

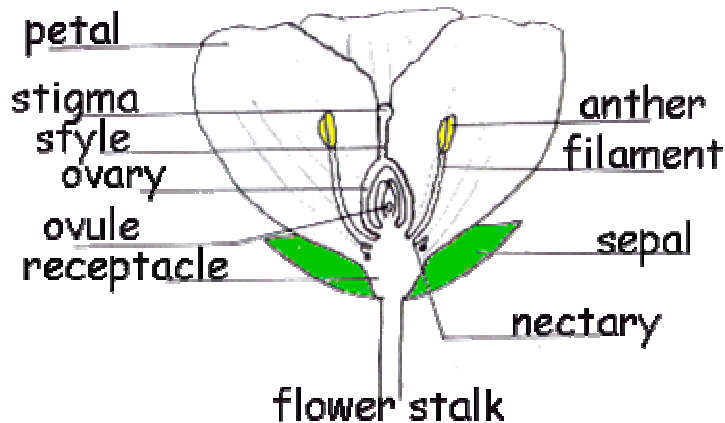
Shelter

Food

Importance of  
Plants

It is suggested that you use this sheet alongside a simple flower dissection. You can either use bought flowers such as daffodils or tulips or some from a garden or the school grounds such as apple blossom, strawberry flowers or buttercups. If you are using wild flowers it is an excellent opportunity to discuss the ethics of collecting wild animals and flowers, stressing the need for controlled collection.

### The flower parts:



Flower part	Part function
<b>Petal</b>	Petals are used to attract insects into the flower, they may have guidelines on them and be scented.
<b>Stigma</b>	Is covered in a sticky substance that the pollen grains will adhere to.
<b>Style</b>	The style raises the stigma away from the Ovary to decrease the likelihood of pollen contamination. It varies in length.
<b>Ovary</b>	This protects the ovule and once fertilization has taken place it will become the fruit.
<b>Ovule</b>	The Ovule is like the egg in animals and once fertilization has taken place will become the seed.
<b>Receptacle</b>	This is the flower's attachment to the stalk and in some cases becomes part of the fruit after fertilization e.g. strawberry.
<b>Flower stalk</b>	Gives support to the flower and elevates the flower for the insects.
<b>Nectary</b>	This is where a sugary solution called nectar is held to attract insects.
<b>Sepal</b>	Sepals protect the flower whilst the flower is developing from a bud.
<b>Filament</b>	This is the stalk of the Anther.
<b>Anther</b>	The Anthers contain pollen sacs. The sacs release pollen on to the outside of the anthers that brush against insects on entering the flowers. The pollen once deposited on the insect is transferred to the stigma of another flower or the same flower. The ovule is then able to be fertilized.

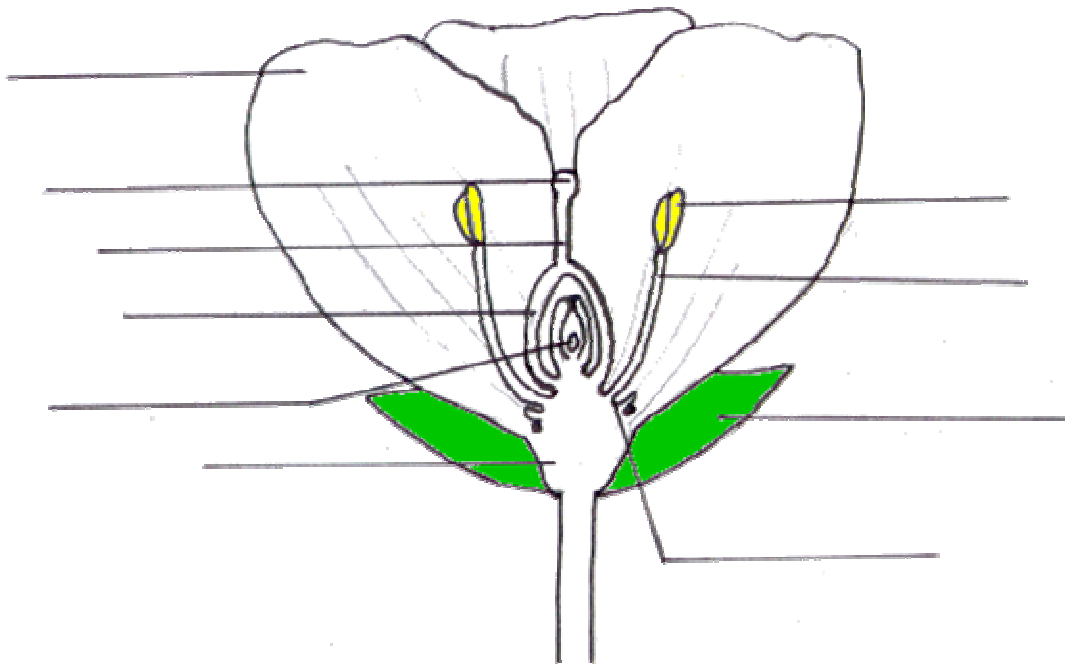
**Please note:**

The stigma, style, ovary, and ovule are often known collectively as the **carpel** or female parts of the flower.

The filament and the Anthers are collectively known as the **Stamen** or the male parts of the plant.

The Parts of a flower

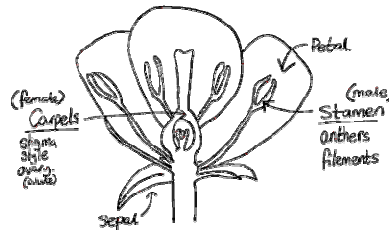
Can you fill in the names for the different parts of the flower?



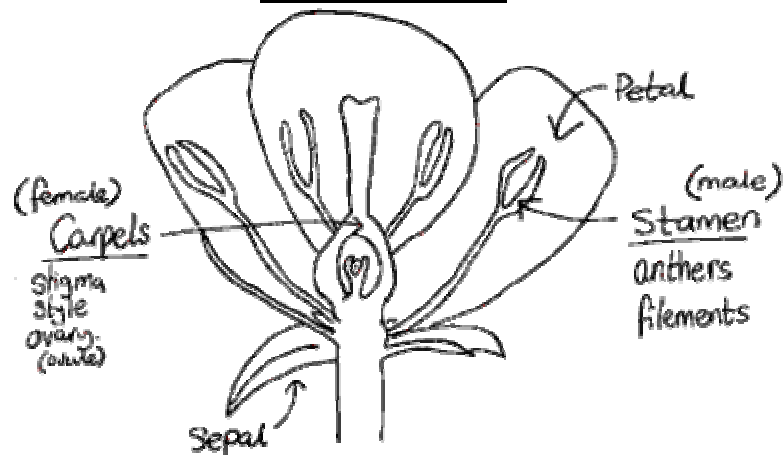
<http://www.naturegrid.org.uk/qca/flowerwork.html>



## The Parts of a Flower



### Teacher's Notes



Four parts of a flower -> arranged in rings inside each other.

Sepal - Protected the flower when it was in bud. The sepal is often green.

Stamen - The male part of the plant which produces the pollen (yellow, dust like).  
(anthers -> tops of stamen, filaments -> bottom part)

Petals - Brightly colored in insect pollinated plants. Small (or non-existent) in wind pollinated plants.

Carpel - The female part of the plant which produces fruit once pollination has taken place. The fruit contains seeds. (Carpels. stigma -> top where it gets pollen, style -> pollen travels down, ovary -> where fruit is formed)

Pollination - When pollen is passed from the stamen to the carpels either by

insects who go to feed on nectar of flower. Or insects who brush against stamens and collect pollen, or by insects who brush against carpel and pass on pollen.  
Wind -> Pollen is blown by the wind. The wind pollinated the flowers that usually have small or non-existent petals and light pollen.

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### **The parts of a flower (worksheet for older students)**

***Copy and label the diagram. Then copy and complete these sentences.***

A flower is usually made up of \_\_\_\_\_ parts which are arranged in \_\_\_\_\_ inside each other.

The sepal is the outermost ring. It \_\_\_\_\_ the flower when it was in bud.

The petals of a plant are often \_\_\_\_\_ to attract \_\_\_\_\_.

The stamens are the \_\_\_\_\_ parts of the plant which produce the yellow, dust-like \_\_\_\_\_.

The carpel is the \_\_\_\_\_ part of the plant which produces the \_\_\_\_\_ once \_\_\_\_\_ has taken place.

A flower can be pollinated either by \_\_\_\_\_ or by \_\_\_\_\_.

When a flower is pollinated by \_\_\_\_\_ the \_\_\_\_\_ go to feed on the \_\_\_\_\_ of the flower. They brush against the \_\_\_\_\_ and collect the \_\_\_\_\_. Then they brush against the \_\_\_\_\_ of the same or different flower and pass on the pollen that way.

When a flower is pollinated by \_\_\_\_\_ the \_\_\_\_\_ blows the pollen. In this case the flowers usually have small or non-existent petals.

The pollen reaches the carpel at the place called the \_\_\_\_\_. It travels down the \_\_\_\_\_ until it reaches the \_\_\_\_\_ where a \_\_\_\_\_ is formed.

brightly, carpels, colored, female, four, fruit, fruit, insects, insects, insects, insects, male, nectar, ovary, pollen, pollen, pollination, protected, rings, stamen, stigma, style, wind, wind, wind

## The parts of a flower (worksheet for younger students)

**Copy and label the diagram. Then copy and complete these sentences.**

A flower is usually made up of f\_\_\_\_\_ parts which are arranged in r\_\_\_\_\_ inside each other.

The sepal is the outermost ring. It pr\_\_\_\_\_ the flower when it was in bud.

The petals of a plant are often b\_\_\_\_\_ c\_\_\_\_\_ to attract in\_\_\_\_\_.

The stamens are the m\_\_\_\_\_ parts of the plant which produce the yellow, dust-like p\_\_\_\_\_.

The carpel is the f\_\_\_\_\_ part of the plant which produces the f\_\_\_\_\_ once p\_\_\_\_\_ has taken place.

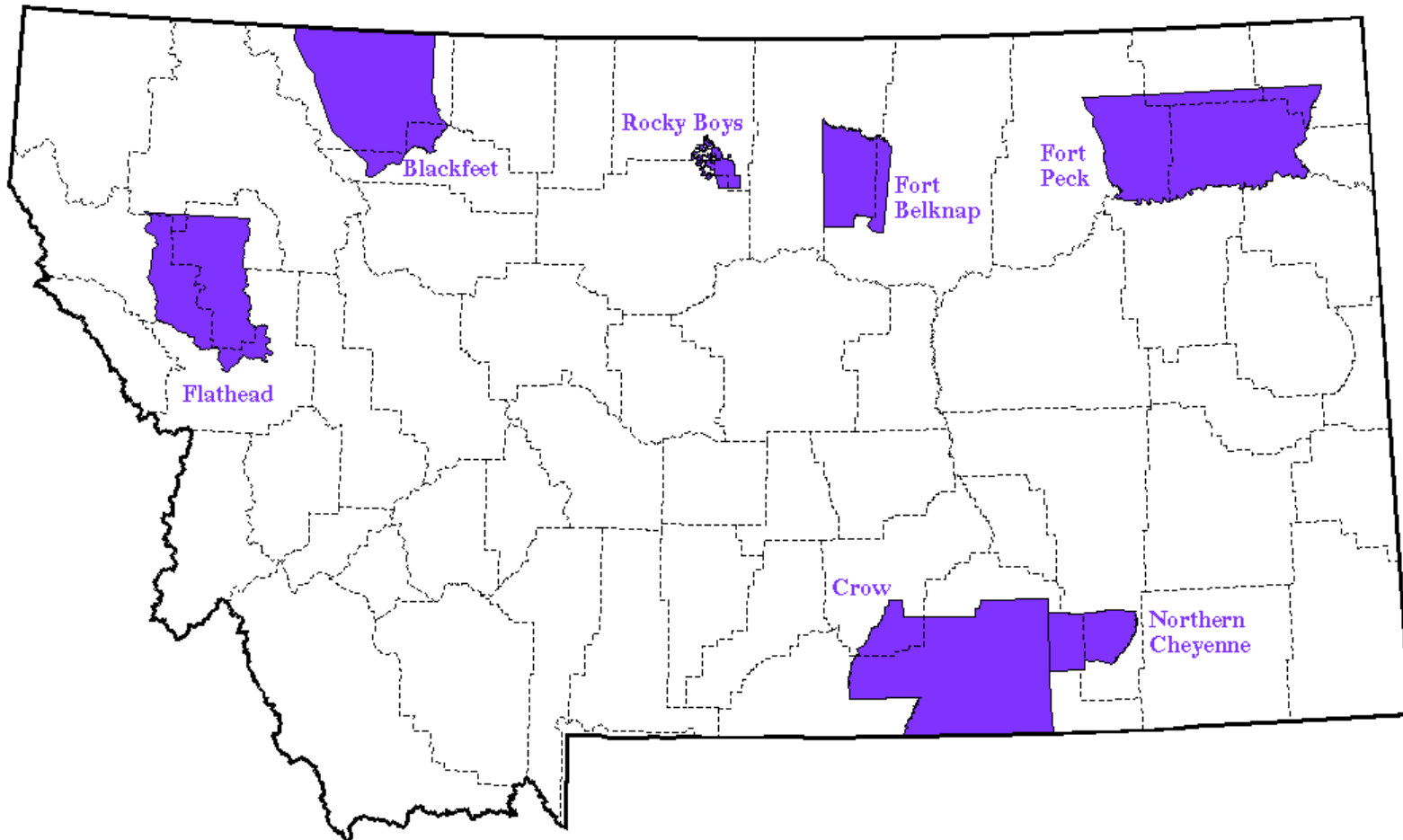
A flower can be pollinated either by in\_\_\_\_\_ or by w\_\_\_\_\_.

When a flower is pollinated by in\_\_\_\_\_ the in\_\_\_\_\_ go to feed on the n\_\_\_\_\_ of the flower. They brush against the s\_\_\_\_\_ and collect the p\_\_\_\_\_. Then they brush against the c\_\_\_\_\_ of the same or different flower and pass on the pollen that way.

When a flower is pollinated by w\_\_\_\_\_ the w\_\_\_\_\_ blows the pollen. In this case the flowers usually have small or non-existent petals.

The pollen reaches the carpel at the place called the s\_\_\_\_\_. It travels down the s\_\_\_\_\_ until it reaches the o\_\_\_\_\_ where a f\_\_\_\_\_ is formed.

brightly, carpels, colored, female, four, fruit, fruit, insects, insects, insects, insects, male, nectar, ovary, pollen, pollen, pollination, protected, rings, stamen, stigma, style, wind, wind, wind



<http://www.hedgesoutdoors.com/images2006/mtres.gif>

