Grasses, Forbs, and Shrubs. Oh My!

Grade: 4-6

Duration of Lesson: 1 week

Brief: Students will learn about rangeland plants and plants native to Montana. They will take quizzes and photograph different species.

Materials:
Grasses, grass-likes, forbs, and shrub handouts
Grasses, grass-likes, forbs, and shrub quizzes
Useful website: Montana Kids-Bluebunch Wheatgrass:
http://montanakids.com/facts_and_figures/state_symbols/state_grass_bluebunch_wheatgrass.htm

Key Terms
Grasses, grass-likes, forbs, shrubs, rushes, sedges, leaf veins, fibrous, hollow, jointed, parallel, taproot, bulbous

Standards / Objectives

Arts Content Standard 2: Students apply and describe the concepts, structures, and processes in the Arts. 2. Visual Arts: Apply knowledge of techniques to create works. **End of Grade 8.**
Arts Content Standard 4: Students analyze characteristics and merits of their work and the work of others.1. Evaluate the quality and effectiveness of their own and other art works by applying specific criteria appropriate to the style and offer constructive suggestions for improvement. **End of Grade 8.**

NGSS 4. Structure, Function, Information Processing
Disciplinary Core Ideas, LS1.A: Structure and Function
Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)
NGSS MS. Interdependent Relationships in Ecosystems
Disciplinary Core Ideas, LS2.C: Ecosystems Dynamic, Functioning, and Resilience
Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)

Understanding(s) /Big Ideas:	Essential Question(s):
There are many different plant species, and they are categorized into four main branches. It is important to know basic plants that live in your region.	How are plants classified? How can you identify different plants? How can you help others identify plants?
Students will know:	Students will be able to:
The difference between grasses, grass-like, forbs, and shrubs. The different plant species that make up Montana rangelands.	Identify grasses, grass-like, forbs, and shrubs. Explain how plants can be identified.
Performance / Observations	
Performance Task(s):	Other Evidence:
Students will be completing mini quizzes and photographing different plant species.	Students will discuss how plants can be identified.
Learning / Inquiry Activities	

Introduction:

Grasses are one of the largest families in the plant kingdom. Grasses are classified in six main groups: grazing and forage grasses, turf grasses, ornamental grasses, cereals, sugar cane, and woody grasses. Grass is the main food for many grazing animals. Montana's state grass is bluebunch wheatgrass. Common grasses found on Montana rangelands are: Blue grama, buffalo grass, wheatgrass, timothy, bluestem, needlegrass, and brome grass. Grass flowers are not showy and leaf veins are parallel. Stems are joined and usually hollow.

Grass like plants look like grass but have different characteristics that make them grass-like. Examples of grass-like plants are rushes and sedges. Flowers are not showy and veins in the leaves are parallel. Stems are solid and not jointed. Sedges have triangular stems and rushes have round stems ("sedges have edges and rushes are round").

Forbs are broad-leafed, non-woody plants. They usually have very showy flowers. Shrubs are plants with woody stems. They may also be called bushes, especially if they have many branches. They provide food for birds and animals and protect the soil from erosion.

Learning / Inquiry Activities:

1. Discuss the 4 different kinds of plants that make up a rangeland. Ask students if they can come up with examples of each type of plant.

2. Talk about Montana's state grass and show pictures of what it looks like. http://plants.usda.gov/core/profile?symbol=pssp6

3. Explain the characteristics of grasses and give students the Grasses worksheet and mini quiz. Do the same for grass-likes, forbs and shrubs.

4. Hold a photo contest. Have students bring in photos they took of grasses, grass-likes, forbs, or shrubs. These photos can be hung on the wall or laid out on the table so students can vote for their favorite photo (tell them they can't vote for their own photo). Each student will tell the others what kind of plant they took a picture of (grass; grass-

like; forb; or shrub) and how they determined what kind of plant it is. Another alternative is to walk around the school and have students determine what kinds of plants are outside or have students realistically illustrate plants.

We invite you to send photos or information on your experience teaching the lesson to the Montana Department of Agriculture's Ag in the Classroom lbrenneman@mt.gov
This lesson was adapted from Agriculture in Montana Schools, http://aginmontanaschools.com/

Rangeland Plants

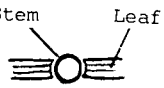
Montana is a rangeland state. 70% of the land area is rangeland. The four major kinds of plants that make up Montana's rangeland are: grasses, grass-like plants, forbs, and shrubs.

Grasses are one of the most important kinds of range plants. Not only do they cover more than a fifth of the land surface, but they are the most widely distributed of all plants. They are the soil builder. They help to create rich black prairie soil, and protect the soil from erosion. The grasses include the cereal grains and supply most of the forage for livestock.

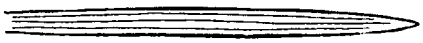
GRASSES

- Flowers are not showy and usually are the same color as the stems and leaves.

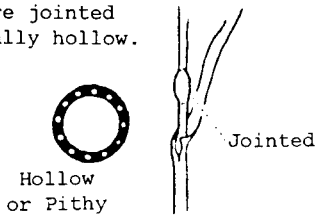
- Leaves are in two rows on the same stem.



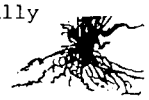
- Veins in the leaves are parallel.



- Stems are jointed and usually hollow.



- Roots are usually fibrous.



GRASSES

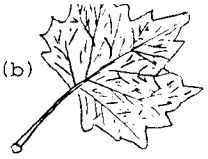
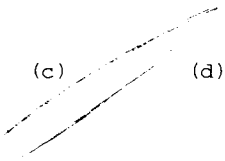
Grass Plant Parts

MATCHING:

Grass leaves are usually in ____ rows on the stem

(a) two (b) four (c) three (d) five

The veins in grass leaves look like ____.

(a)  (b)  (c)  (d) 

3. The stem in a grass looks like

The stem in a grass looks like _____.

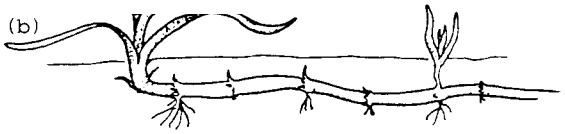
(a)  (b)  (c)  (d) 

4. Grass stems are usually _____

Grass stems are usually _____.

5. The roots of a grass usually look like _____.

The roots of a grass usually look like _____

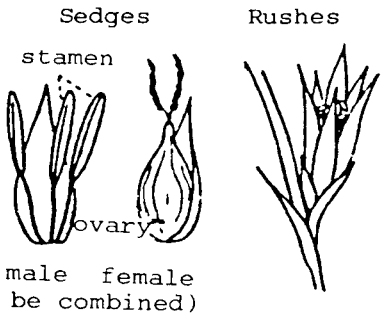
(a)  (b) 

6. Grass flowers are like_____.

Grass Flowers are like _____.

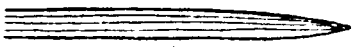
(a)  (b) 

- Flowers are not showy, usually small and brown

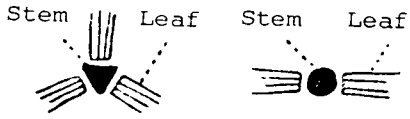


Flowers

- Veins in the leaves are parallel



Parallel Veins



Leaves on 3 sides of stem

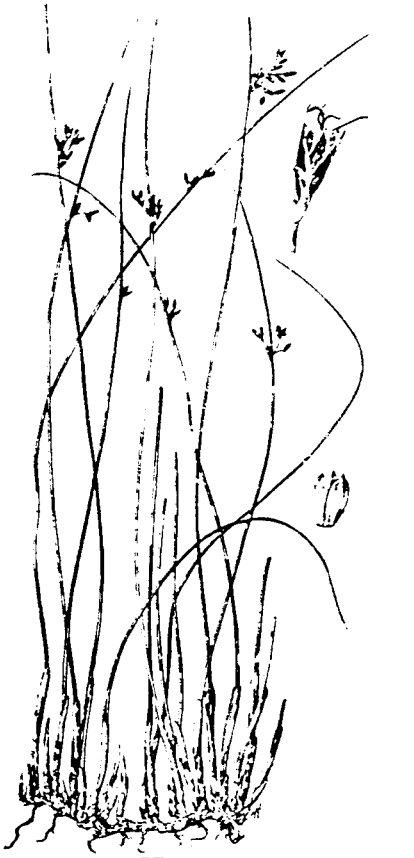
Leaves on 2 sides of stem, rounded

Leaves

- Stems are solid and not jointed
- Stems may be triangular or round

Solid - Not Jointed

- Roots are usually fibrous

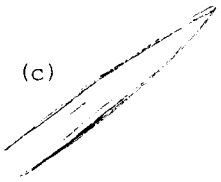


GRASS-LIKE PLANTS

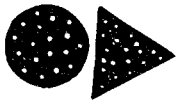
1. Grasslike plant leaves are usually in _____ or _____ rows on the stem.

   (a) two (b) three (c) four (d) five

2. The veins in grasslike plant leaves look like_____.

   (a)  (b)  (c)  (d) 

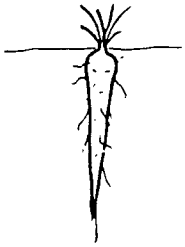
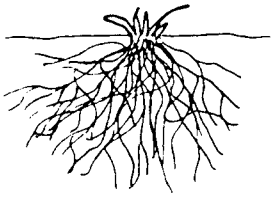
3. The stem in a grasslike plant looks like_____.

   (a)  (b)  (c)  (d) 

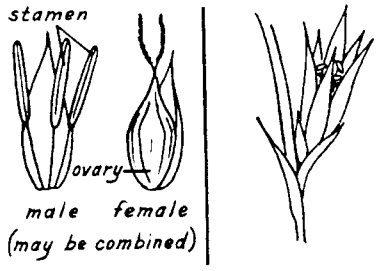
4. Grasslike plant stems are usually _____.

   (a) jointed (b) non-jointed

5. A grasslike plant's roots usually look like_____.

   (a)  (b) 

6. Grasslike plant flowers are like_____.

   (a)  (b) 

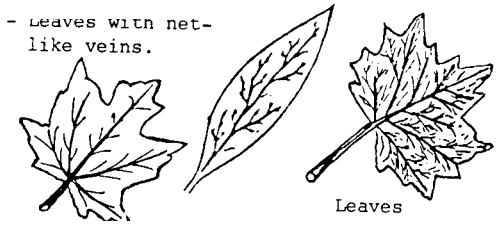
Forbs

Forbs are broad-leafed, non-woody plants with net like veins in the leaves. Many garden plants and plants we call weeds are forbs. Their flowers are usually colorful and show. The stems die back to the base of the plant each year. These plants may have fibrous, tap, or bulbous roots.

-Flowers are usually showy.

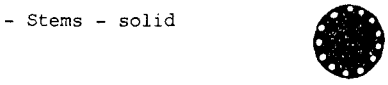
Flowers

-Leaves have net-like veins.

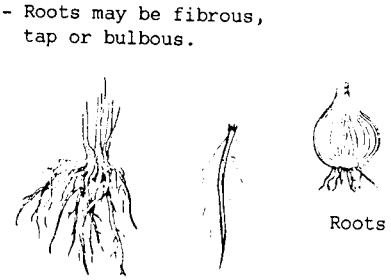


Leaves

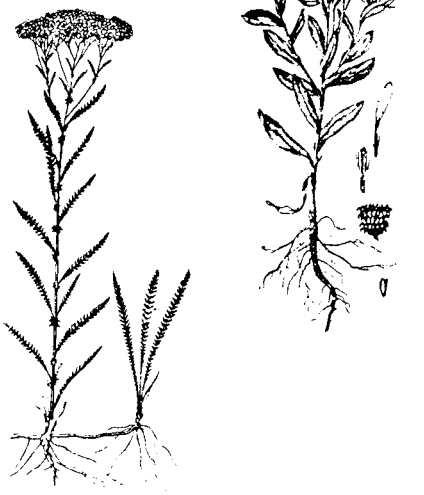
-Stems are solid



-Roots may be fibrous, tap, or bulbous



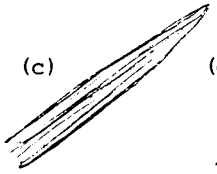
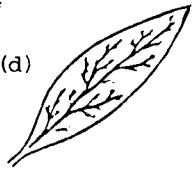
Roots



Forb Plant Parts

MULTIPLE CHOICE

The veins in forb leaves look like ____, _____, and _____.

(a)  (b)  (c)  (d) 

The stem in a forb looks like _____.

(a)  (b)  (c)  (d) 

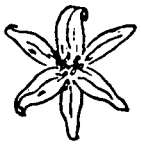
Forb stems are usually _____.

(a) jointed (b) not jointed

A forb's roots usually look like _____, _____, and _____.

(a)  (b)  (c)  (d) 

Forb flowers are usually like _____.

(a)  (b) 

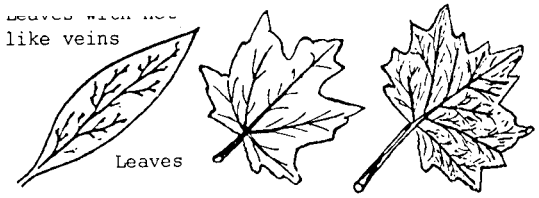
Shrubs

Shrubs are woody plants with stems that live over winter and branch from near the base. They are like trees, but usually are smaller. The flowers are usually colorful. The leaves have net-like veins, and are shorter and wider than grass leaves. A shrub has a large taproot or strong, branching roots.

-Flowers are colorful

Flowers

-Leaves have net like veins

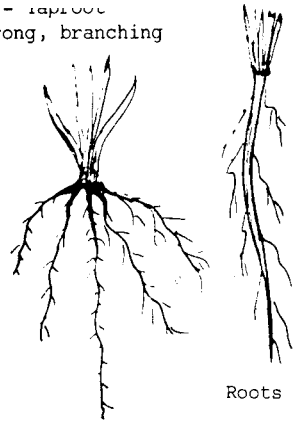


-Stems are woody with growth rings

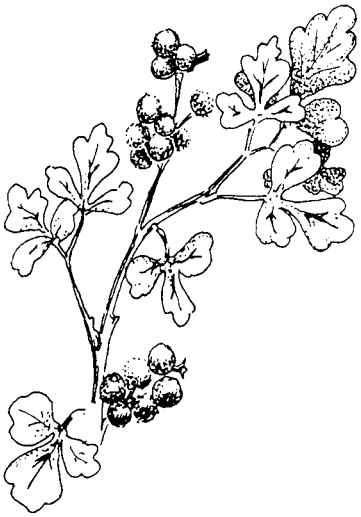
Growth rings

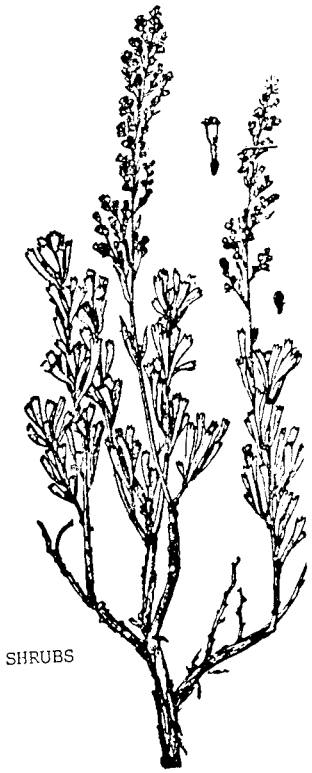
Woody
Solid

-Roots are taproots or strong, branching roots



Roots

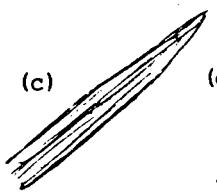
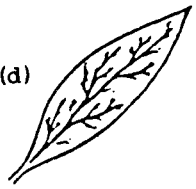




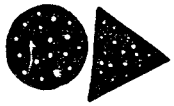
SHRUBS

Shrub Plant

The veins in shrub leaves look like ____, ____, or _____.

(a)  (b)  (c)  (d) 

The stem in a shrub looks like _____.

(a)  (b)  (c)  (d) 

Shrub stems are usually _____.

3. Shrub stems are usually _____.

(a) jointed (b) non-jointed

A shrub's roots usually look like _____.

4. A shrub's roots usually look like_____.

(a)  (b)  (c)  (d) 

Shrub flowers are usually like _____ or _____.

5. Shrub flowers are usually like _____, _____.

(a)  (b)