



LIFE IN A GRASSLAND

Grades 2-3
2 Hours

Thank you for booking our “Life in a Grassland” program at FortWhyte Alive. This Program is designed to help your students learn about the prairie ecosystem. Students will have the opportunity to net insects, create a soil profile, and explore prairie plant and animal adaptations.

Appropriate Dress for Your Field Trip

To ensure that students get the most out of their FortWhyte experience, we ask that they be appropriately dressed for a 2-hour outdoor excursion. All of our programs include time outdoors, regardless of weather. Comfort and safety are key in making this an enjoyable and memorable experience.

Suggestions for Outdoor Dress

Layering of clothing is very important in maintaining body temperature and in remaining dry. Four thin garments may offer the same degree of warmth as one thick overcoat, but the four layers allow much greater flexibility. Layers can be shed or added as temperature, wind, exertion, or other variables dictate.

Waterproof outer layers are also important. Rain may get us wet but so will dew on grass, melting snow on pants and puddles in the spring. Boots in the winter are always important to keep moisture out and heat in.

***Please share this information with other teachers that are coming to FWA with your group.**



GOAL

To increase students' awareness of grassland soils, plants, and animals.

OBJECTIVES

Students will:

1. Identify soil components including humus, organic matter and mineral matter.
2. List several grassland plants, animals and insects and describe characteristics that allow them to live in grassland habitats.
3. Describe features of grasslands that make them unique
4. Describe what Southern Manitoba looked like before settlement.





VOCABULARY

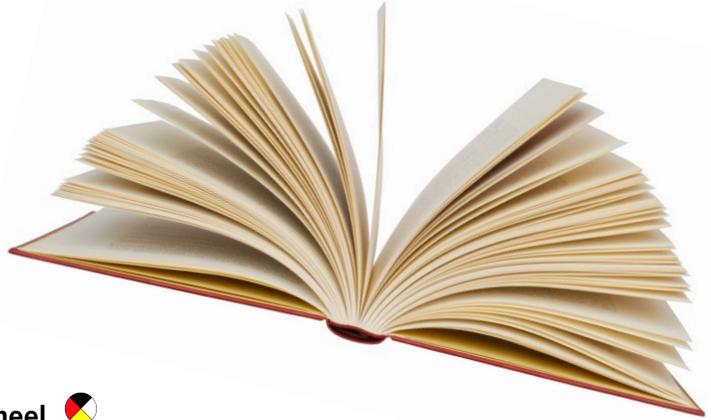
- Adaptation:** A behavior or feature in a plant or animal that allows it to survive in its habitat.
- Grassland:** Plains with dense grasses, sparsely distributed trees and sometimes an abundance of herbaceous plants. Provide ideal habitat for a rich variety of herbivores and their predators.
- Humus:** Finely broken down organic matter; gives topsoil its dark colour.
- Leaf:** The part of a plant which photosynthesizes – that is, acts like a solar panel to collect sunlight and turn it into energy to produce sugars. Leaves can be broad and flat like a maple leaf, long and thin like a pine needle, or scaly like the leaves of a cedar tree.
- Mineral Matter:** The inorganic part of soil; miniscule particles of weathered bedrock.
- Prairies:** North American grasslands.
- Nutrient:** Any material taken in by a living thing to sustain life. It may be a mineral, like phosphorus, or an organic compound, like carbohydrate.
- Organic Matter:** The organic part of soil; particles of decaying plants and animals.
- Pollen:** In flowering plants, a yellow powder on the stamens of one flower that joins with the ovule of another flower to make a seed. Many plants need insects to spread their pollen.
- Root:** The underground portions of a plant which absorb water and minerals from the ground.
- Seed:** A reproductive structure containing an embryo plant and a food store.



LITERATURE CONNECTIONS

All of the books listed below relate to the theme of grasslands, are recommended for elementary students, and are available through the Winnipeg Public Libraries and/or the Manitoba Education Instructional Resources Library. You may wish to make these titles available in your classroom surrounding your 'Life in a Grassland' field trip.

Books and activities with an Aboriginal perspective are indicated with a medicine wheel. 



Fiction

- > **In the Tall, Tall Grass** by Denise Fleming
- > **Bobby Bluestem** by Rhonda O'Grady
- > **If You're Not From the Prairie** by David Bouchard
- > **Little House on the Prairie** (series) by Laura Ingalls Wilder
- > **Stories From Where We Live: The Great North American Prairie** by Sara St. Antoine 
- > **Prairie Summer** by Nancy Hundal
- > **Honouring the Buffalo: A Plains Cree Legend** by Judith Silverthorne 

Non-Fiction

- > **In Fields and Meadows** by Tessa Paul
- > **Endangered Grassland Animals** by Dave Taylor
- > **The Land Where the Sky Begins** by Dennis Fast and Barbara Huck
- > **Prairie Dogs** and **Prairies** by Dorothy Hinshaw
- > **A Tall Grass Prairie Alphabet** by Claudia McGehee
- > **Living on the Plains** by Allan Fowler
- > **People of the Buffalo** by Maria Campbell 



PRE-VISIT ACTIVITIES

THE PRAIRIES THEN AND NOW (1-3 lessons)

Science/Social Studies/Language Arts

Before coming to FortWhyte, encourage students to explore what defines the grassland or Prairie ecosystem. The Prairie region is relatively dry and is characterised by rich soil, diverse grasses and other flowering plants, low shrubs, and small stands of trees. Examples of animals include grazing animals, burrowing animals, birds, and insects.

Many students do not realize that what we think of as “Prairie” today is mostly agricultural farmland. Less than 1% of intact native Prairie remains in Manitoba. Because of this, students may need help visualizing the Prairies of the past. Read the *Prairie Visualization* (**Attachment 1**) aloud to students and have them reflect on what they experienced. What did they see in their mind’s eye and how is it different from the farmland they see when driving outside of Winnipeg today? Students might journal, sketch, or use a graphic organizer to compare and contrast the prairies then and now.

Extension Ideas:

- > Re-read the visualization slowly and have students attempt to identify the various plants and animals that are described. Bolded numbers in the text indicate where a particular plant or animal is referred to. A list at the end of the document identifies all of the species by their common names. Research these species further, find pictures of them, and find out what their current status is in Manitoba. Predict which plants and animals you might see at FortWhyte on your upcoming field trip.
- > Print copies of the *Pristine Prairie* (**Attachment 2**) and have students imagine they are entering into the pictures. What would they see, hear, feel, and smell? Now repeat the exercise with *Agricultural Land* (**Attachment 3**). Have students talk or write about each experience.





SUPER DUPER SOIL (1-3 lessons)

Science

Without healthy soil plants cannot grow. But what makes soil healthy? To many children, all soil may seem more or less the same. Here are two activities to get them thinking more about it!



- > Take a walk around the neighborhood of your school and collect some different soil samples. Ideally, find at least four or five samples that are different in colour, texture, and composition (clay, sandy, compacted, peaty). At each sampling location have students use magnifying lenses to look closely for insect life and note the kinds of plants that are growing nearby. Do different plants grow in different types of soil? Are there more insects at certain locations? What is the soil like in high traffic areas? Place the samples in jars or plastic bags and record the differences between them. Try watering each sample and notice how quickly/well it absorbs water. You may also choose to put your soil samples into tight-lidded glass jars, top them with water, shake them, and allow them to settle out in layers (heaviest at the bottom, lightest at the top). If you have time, try planting a seed in each type of soil and compare how the plants do.
- > Collect worms along with the soil you found them in and watch them in a jar for a few days (make sure to poke holes in the jar). Students will be able to see how worms aerate soil by creating tunnels. Are there other animals that also “fluff up” the soil and make it healthier? For more information visit:
: <http://kids.nationalgeographic.com/animals/earthworm/> and
<http://www.soils4kids.org/home>

BISON INVESTIGATIONS (1-2 lessons)



Science/Social Studies/Math

In the program “Life in a Grassland” students will visit FortWhyte Alive’s bison herd. Listed below are some hands-on suggestions for helping your students to gain some background understanding of the natural and cultural significance of bison on the Prairies:

- > Using a meter stick or tape measure, measure out the size and height of an adult male bison in your classroom (*height = 2.5m, length = 4.6m*). Bison weigh roughly 1600kg and can run more than 50 km/h. Bison also have horns and thick skin. Ask your students to imagine how dangerous and difficult it would be to hunt a single bison, let alone bison in a herd of hundreds.



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- > Have students look at a picture of a bison (**Attachment #4**) and brainstorm all of the possible parts that could be harvested from it (inside and outside). What could all of these different parts have been used for? **Attachment #4** also includes a list of traditional uses.
 - > Why do we no longer see herds of bison roaming the prairies today? What happened to them? Have other Prairie animals also disappeared from the landscape? Nine out of ten of Manitoba's endangered species live in the prairies. Research endangered prairie animals such as the burrowing owl, the swift fox or the black-tailed prairie dog. Why have these animals become endangered? What can we do to help?

SORTING OUT SEEDS PART 1 (1-2 lessons)

Science/Visual Art



In the program “Life in a Grassland” students will have the opportunity to compare and contrast different types of prairie seeds and plants. Prior to your field trip, ask students where new plants come from and remind them that all plants produce seeds—even trees and grasses! Go on a walk through your school’s neighborhood or to a local green space and see how many different types of seeds you can find and collect (be careful not to hurt plants when collecting seeds). One option is to have students use duct tape to collect small seeds that might otherwise get lost.

Once you have found seeds of all different shapes and sizes, bring them back to the classroom to investigate further. Have students categorize/classify the seeds according to a variety of factors (e.g. colour, size, shape). Discuss seed dispersal. How does each seed move from one place to another? Some seeds move in the wind, others by being eaten (passing through the digestive tracts of animals), and still others by attaching themselves to animals’ fur (burs). Can you find examples of each type of dispersal amongst your seeds?

Have students carefully sketch and/or label different types of seeds to refer to later.





POST-VISIT ACTIVITIES

A BUG'S EYE VIEW (1-2 lessons)



Science/Language Arts

During the program “Life in a Grassland” students searched the prairie for insects. In your own schoolyard, repeat this activity. If you don’t have access to nets, simply have students mark off a small area to search through by hand (hula hoops work well for this purpose) or send them to search within pre-defined boundaries. Magnifying lenses are a big asset for this activity.

What kinds of insects did you find in your schoolyard? How do they compare to what you found at FortWhyte? Why are there differences? Would you consider your schoolyard to be a grassland? Why or why not?

Give each student a piece of string roughly 1m long and have them use a marker to randomly mark 5-7 dots along it at varying intervals. In the schoolyard or another natural space have students lay their strings on the ground and take a “micro-hike”. Students imagine they are a tiny insect hiking along the length of the string. At each dot, they must stop and describe their journey. Students might write about their treacherous climb up a stalk of grass or their confusion at encountering a mountainous boulder (pebble) blocking their path. Extend this activity by researching common schoolyard insects. A great resource for doing so is *Schoolyard Ecology* by Katharine Barrett. You may also wish to use FortWhyte’s guide to grassland insects (**Attachment #5**).

SORTING OUT SEEDS PART 2 (1-5 lessons)

Science

The prairies are home to many different types of plants with many different kinds of seeds. But all seeds share certain features in common. Do a seed dissection with your class to discover some of these features! Though lima beans do not grow on the prairies, they are a great choice for a seed dissection because of their size and the fact that they are easy to buy. Soak lima bean seeds overnight to soften them up and then provide each student with a seed, a magnifying glass, and a paper towel. For more instructions and a diagram on lima bean seed dissections visit <http://sciencenetlinks.com/lessons/look-at-those-seeds-grow/>. Have students sketch their observations in a journal.

What features make prairie plants and seeds unique? For one thing, grasses are scientifically known as “monocotyledons” or “monocots” which means that, unlike lima beans, their seed embryos have only one tiny leaf instead of two. Prairie plants also have many special adaptations that help them to survive the harsh realities of life in a grassland. These adaptations include waxy





coatings on leaves for water retention and deep, extensive root systems. Share **Attachment #6** with students to see how much of a prairie plant is actually underground. Root systems like these hold the top soil in place, allow the plants to reach water deeper down, and allow them to quickly re-grow if they are grazed or burned by a prairie fire. For more information on prairie plant adaptations visit http://www.museum.state.il.us/muslink/prairie/htmls/eco_adapt.html

NATIVE PRAIRIE GARDEN (ongoing)

Science

FortWhyte Alive's **Naturescape for Educators** resources are available online and provide information on planning a schoolyard greenspace and planting a native butterfly garden, and certifying your schoolyard as a Naturescape. Using the butterfly garden resource, have students choose and research plants that provide food for butterflies and caterpillars. To learn more about professional development opportunities that can help you in using your outdoor teaching space, contact education@fortwhyte.org.



TRACKING THEM DOWN (1-3 lessons)



Social Studies/Science

We may not always spot animals when we go outdoors, but if we look carefully we can nearly always spot evidence of them. Tracks, scat, eggs, bite or chew marks, and nests are among the many exciting clues that reveal the variety of animal life in our neighborhoods and communities. In the program “Life in a Grassland” students have the opportunity to examine the tracks of common prairie animals. Repeat this activity near your school. What evidence of animal life can you find in your local neighborhood? Visit http://www.biokids.umich.edu/guides/tracks_and_sign/ for an interactive guide to animal tracks and other clues.

The ability to interpret animal tracks is a crucial skill in traditional First Nations life. Why has this skill been so important for so long? Check out “The Hunt”, an episode of Wapos Bay, from the Manitoba Education Resources Library for a short, animated film about three young Cree children learning the importance of traditional tracking knowledge (<http://library.edu.gov.mb.ca/cgi-bin/koha/opac-detail.pl?biblionumber=49074>).





Attachment #1

PRAIRIE VISUALIZATION

Ask students to set aside all pens and pencils. Have them close their eyes and relax while you read the following visualization slowly and with expression. Don't forget to pause and give students time to flesh out their images. Skip over bold numbers where they appear. They are part of a post reading activity.

Close your eyes and imagine that...

You are standing outside with your eyes closed. You know you are outside because you can feel a cool, fresh breeze in your hair and on your face. It whistles through your clothing and rushes past your ears. You can hear it rustling through leaves and plants all around you. You smell wet soil, rich and a little bitter. Also, a slightly sweet and spicy smell that reminds you of your kitchen. It smells like a familiar herb **(1)**. The cool air tickles your nostrils as you inhale again and open your eyes.

The first thing you notice is the sky. All around you in every direction the sky stretches like a perfectly round upside-down dome. The brisk wind is pushing ragged clouds across a bright blue background. In the distance you can see high piles of dark grey clouds that might be thunderheads. But closer to where you are standing rays of sun stream down, dappling the landscape around you.

You are standing on a small hill and for as far as you can see, all the way to the horizon, the Prairie stretches out around you. Grasses of all different heights are bending and swaying like waves in the ocean. Much of the grass is as high as your chest. Some of it is taller. A thousand shades of green blend into browns, blues, and yellows. Here and there dots of brightly coloured wildflowers catch your eye. You can follow the pattern of the wind as it traces its way across the landscape. In one place it turns up the silvery undersides of grass stalks, reflecting the sunlight and making you squint. In another, it shakes the boughs of a stand of slender, white trees. Their small, heart-shaped leaves tremble and dance against the blue sky **(2)**. A small bit of white fluff whips past your ear and you watch it as it spirals away across the land **(3)**. It dips and twists and finally catches in the up-reaching twigs of a light green shrub **(4)**.

Over the rustle of the wind you hear a high-pitched scream above your head. Looking up, you see the silhouette of a large bird with straight, outstretched wings. It is riding an up-draft, circling comfortably higher and higher in spite of the strong breeze. The undersides of its wings are dark, separated by a lighter body. Its tail fans out in a half-circle of deep, glossy red-brown feathers **(5)**. It screams again, wild and raw, as its sharp eyes search the prairie below. Suddenly, not too far from your feet you hear a scuffling noise and see a small rodent about the size of a rabbit sitting up on its hind legs. It is light brown with big eyes and a black tail **(6)**. It wrinkles its nose and lets out a series of sharp barks. "Choo! Choo! Choo! Choo!" it calls as the hawk glides overhead. Then it turns tail and disappears down a hole. Looking around you notice that there are other holes of a similar size on the hill where you are standing. Bits of grass and stems are piled and broken on the ground around them.





Bending down to look more closely at one of the holes, you notice a light pink ball growing nearby. The ball is actually made of tiny, tiny pink flowers and is attached to a plant whose grey-green leaves look heavy and full **(7)**. You gently reach out and tear off a piece of leaf and as you draw your finger away you notice a thick, white liquid forming beads where the leaf was torn. It looks like milk and leaves a sticky residue on your fingers. Nearby, a black and orange butterfly flutters past **(8)**.

Now that you are down at ground level your eyes adjust to the details of the landscape. Even in the small area around your feet there are plants of all different shapes and sizes. Creeping ground cover **(9)** and tiny vines **(10)**; tall purple-ish grasses branching into three or four seed heads at the top **(11)**; nodding sedges **(12)**; hairy awns catching the light **(13)**; tiny flowers with blue petals **(14)**; yellow bunches of goldenrod **(15)**...

And weaving through all of it the trails of animals. Here you spot a nibbled leaf. Over there a spider web. Insects of every shape and colour explore the crevices of this vast landscape on delicate, creeping legs. Just to your right you notice a large, round pile of something brown. It is dry and yet it too is alive with insect life. Tiny larvae, flies, and beetles are moving within it. The ground nearby it is trampled and the soil is marked with large hoof prints **(16)**. You can see a trail of flattened grasses and shrubs leading off in that direction towards the horizon. Not too far away collected rain water sits in the bottom of a shallow depression. The earth is bare around it.

Snakes slither and bask amongst the tall grasses **(17)** and other, bigger, predators move across the canvas of the Prairie as well. A coyote **(18)** or badger **(19)** may beat the hawk to its prey. A burrowing owl may come to forage for insects amongst the bison scat **(20)**.

But though all of these animals are camouflaged somewhere within the landscape, you are mainly aware of the wind, the fresh smell, and the vastness of the Prairie around you. There are no straight lines as far as the eye can see. No roads, no buildings, no airplanes criss-crossing the sky. No signs, no tractors, no fields of crops. There is just the Prairie, this never-ending sea of wind-blown plants and grasses. So many different kinds of plants and animals coming together to form one gigantic system.

You close your eyes again, inhale deeply, and let the wind carry your imagination back to the present moment.





PLANTS AND ANIMALS INCLUDED IN THE PRAIRIE VISUALIZATION

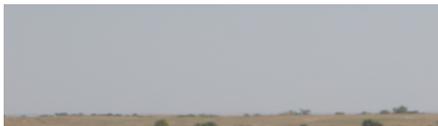
1. Prairie Sage
2. Trembling Aspen
3. Common Cattail
4. Saskatoon Berry
5. Red-Tailed Hawk
6. Black-Tailed Prairie Dog
7. Showy Milkweed
8. Monarch Butterfly
9. Pussy Toes
10. Milk Vetch
11. Big Bluestem
12. Sedges
13. Wild Barley
14. Blue-Eyed Star Grass
15. Goldenrod
16. Bison
17. Red-Sided Garter Snake
18. Coyote
19. Badger
20. Burrowing Owl





Attachment #2

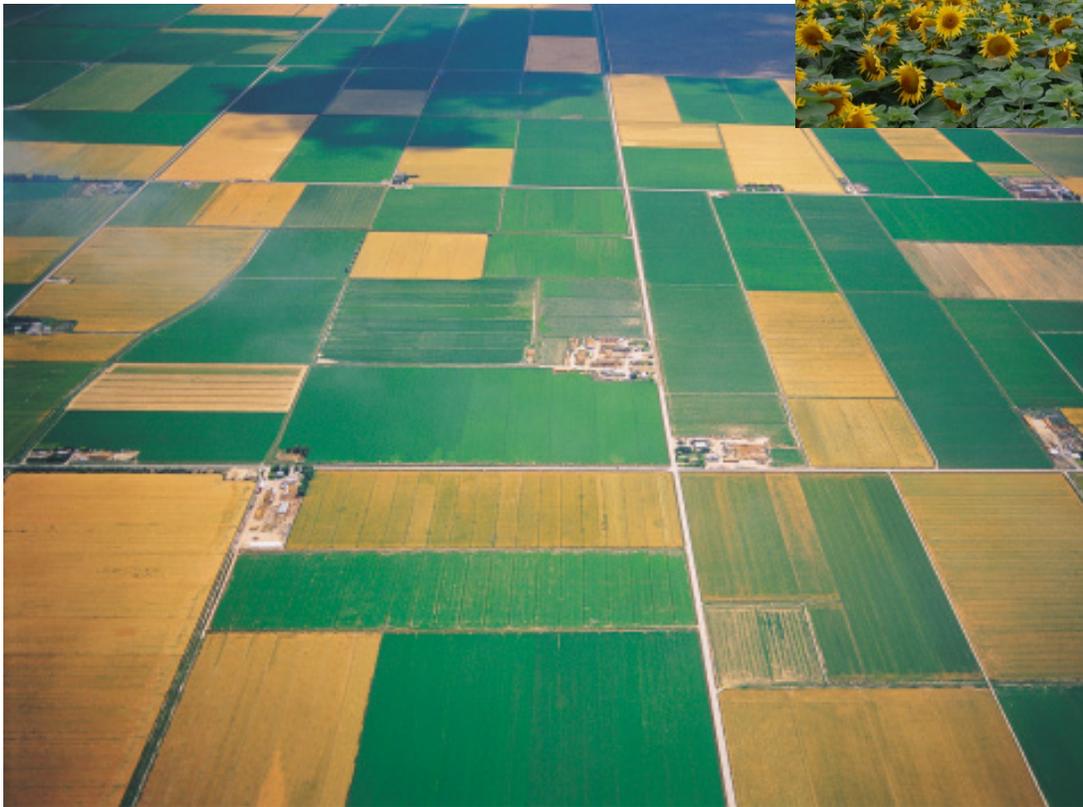
PRISTINE MIXED-GRASS PRAIRIE LANDSCAPES





Attachment #3

PRAIRIE LANDS TODAY: FARMS





Attachment #4



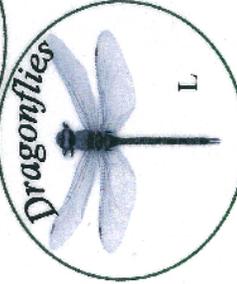
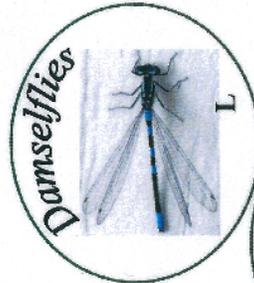
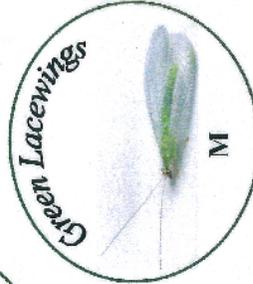
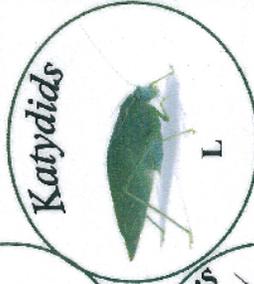
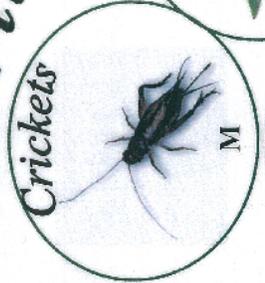
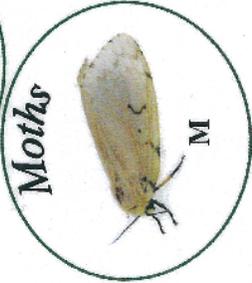
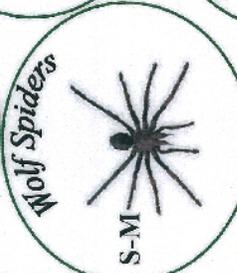
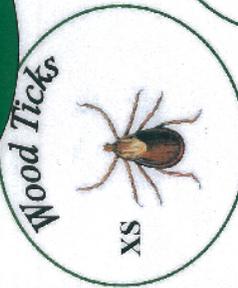
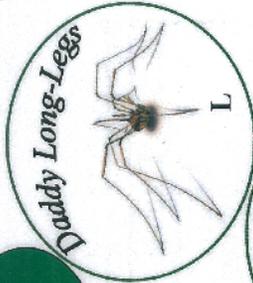
<p>Pelt warm winter clothing floor covering moccasins blankets drums saddles bullboats masks</p>	<p>Chips fuel ceremonial smoking smoke signals</p>	<p>Sinew (muscles) laces thread bowstrings bow backings bindings</p>	<p>Brains hide tanning</p> <p>Teeth necklaces</p>	<p>Skull religious ceremonies</p> <p>Horns headdresses containers clubs cups spoons ladles fire carriers toys</p>	<p>Hair headdresses padding stuffing ropes halters ornaments paintbrushes shields saddles</p>
<p>Hide (without hair) tipi covers clothing parfleches shields containers rattles bedding mittens dolls trade items</p>	<p>Tail whips ornaments fly swatters</p>		<p>Edible Parts meat marrow tongue intestines liver blood other innards</p>	<p>Bones arrow shafts sled runners knives shovels hoes saddle trees war clubs scrapers awls for sewing paintbrushes game counters tool handles ceremonial objects</p>	
<p>Hoofs, Feet glue rattles</p>	<p>Bladder, Stomach waterproof bag pouches cooking vessels water vessels buckets</p>	<p>Fat mixed with powdered meat to make pemmican</p>			



Grassland Critters

Insects

Arachnids: Spiders and kin



Key to sizes:
XS: less than 5 mm
S: less than 1 cm
S-M: less than 2 cm
M: around 2 cm
M-L: above 2 cm
L: above 3 cm



Wasp, Bees & Ants

- Wild Bees** (S-M)
- Parasitoid Wasps** (S)
- Bumblebees** (M-L)
- Yellow Jacket Wasps** (M-L)
- Honeybees** (S-M)
- Ants** (S)
- Long-legged Flies** (S)
- Mosquitoes** (S)
- Flower Flies** (S-M)
- Blowflies** (S)
- Midges** (XS-S)

Insects

- Beetles**
 - Lady Beetles** (XS-S)
 - Weevils** (XS-S)
 - Rove Beetles** (XS-S)
 - Ground Beetles** (S-M)
 - Leaf Beetles** (XS-S)
- Ambush Bugs** (S)
- Lashhoppers** (XS-S)
- Damselflies** (S)
- Assassin Bugs** (S-M)
- Plant Bugs** (XS-S)
- Treehoppers** (XS-S)
- Aphids** (XS)
- True Bugs**
 - Sink Bugs** (S-M)



