LIFE IN A GRASSLAND

GOAL

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

FortWhyte Alive
HUMAN. NATURE.

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

OBJECTIVES

Students will:

1. Describe soil components including humus, organic matter and mineral matter
2. List several grassland plants and animals 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 change 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.

PRE-VISIT ACTIVITIES

1. Discuss what grasslands are. Ask the students if they have ever visited a grassland. What did it look like? What did you find? What was growing there? What animals did you see?

2. Investigate the prairie through books, magazines and Internet research. Some books on the prairie:
   In Fields and Meadows by Tessa Paul, Crabtree Children's Books
   Endangered Grassland Animals by Dave Taylor, Crabtree Children's Books
   In the Tall, Tall Grass by Denise Fleming, Henry Holt and Company
   Prairie Dogs by Dorothy Hinshaw Patent, Clarion Books
   Manitoba's Tall Grass Prairie by Tom Reaume, Manitoba Naturalists Society

3. Have students make a prairie collage from magazine clippings. Include natural prairie elements (plants and animals) as well as cultural elements (aboriginal people, explorers, farmers).

4. Make your own soil and discover the mysteries of soil formation. You will need: a plastic container; soft rocks; shells; sand; clay; dried leaves and plants.
   - Collect several of the above items and add them to the plastic container.
   - Use a fingernail or penny to scratch off sediment and flakes from the soft rock or shells, allowing the flakes to mix with the items in the plastic container.
   - Rub the soft rocks and shells together over the container to disengage more sediment from each.
   - Sprinkle some sand (which is made up of tiny grains of shells and rocks) into the container.
   - Crumble some clay into the container.
   - Crush the dried leaves and plants, and add them to the mixture in the container.
   - Mix all the items together well.
   - Continue collecting the items above and adding them to the mixture each day.

   After several days, observe the amount of rock fragments, sand, clay, and dried leaves and plants that have been accumulated. With a generous amount of each item, the container should be filling up with rich organic soil that would be good for growing plants.

5. Have students research a prairie animal. What does it look like? What does it eat? Where does it make its home? What features of the animal make it well-adapted to life on the prairies?

6. Play the Prairie Passage Game on the following page. The hidden message is “Preserve the Prairie”.

POST VISIT ACTIVITIES

1. Compare how plants grow in different soils. Gather together three types of soils: potting soil, soil from a garden, and sand. Have students put equal amounts of each soil type into plastic cups or plant pots. Label each pot with the kind of soil it contains. Plant three corn seeds about 1" deep in each pot. Pour exactly 1/3 cup of water into each pot. Every third day, add exactly 1/3 cup of water to the pots. Record the date on which each plant sprouted, and the number of seeds that sprouted in each type of soil. When the plants grow their first set of leaves, remove one plant so each pot contains only two (about the same size).

   Follow the progress of the seedlings over a four-week period. At the end of each week, have students make the following observations:
   - The size of each plant.
   - The colour of each plant.
   - The number and condition of the leaves.
   - The strength of the stems.

   Now you are ready to make conclusions: Which soils are best for growing corn plants? Why? What do some soils have that others lack?

2. Build a worm condo. You will need: 2 clear plastic containers, one smaller than the other; screen or piece of stocking; rubber band; dirt; and worms. Place the smaller plastic container inside the larger one, leaving a narrow space between the two containers. Fill the narrow space with fresh soil (do not use potting soil). Make sure the soil is moist, but not drenched. Place worms inside the narrow space. Place the piece of screen or stocking over the top of the containers and secure with a rubber band. Watch how the worms move, tunnel, and aerate the dirt. After a couple of days return the worms to their native habitat.

3. Determine the components of two different soils. Collect soil samples from two areas. Spread each sample out on newspaper and crush any lumps. For each soil type, fill a jar with soil. Label the jar so you know which sample is inside. Pour in water until the jar is full. Screw the lid on TIGHT and shake the jar HARD! Let the jar stand for several hours or until the water clears. The heaviest particles will settle out first (sand) and the lightest particles will settle out last (clay). Organic matter will be seen floating on top of the water.

4. Join a prairie food chain by playing Grasshoppers, Ground squirrels, and Badgers. Two badgers don red scarves. Two thirds of the remaining group are grasshoppers (unmarked) and one third are squirrels wearing blue scarves. Grasshoppers pick up food (poker chips or other small objects). Squirrels try to catch grasshoppers (by tagging them). Badgers hunt the squirrels. How many creatures are "out" after one minute? Have the students theorize what would happen if the numbers of each type of animals changed. What if there were more than two badgers? What if there were more squirrels than grasshoppers? Now have students construct a prairie food chain.

5. Nine out of ten of Manitoba's endangered species live in the prairies. Discuss 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?