

Royal Saskatchewan Museum



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**Safe and Sound
Teacher's Guide
Grades K – 1**

Timetable

The program is one hour in length. Half of the time is spent in the galleries, half in the Discovery Room.

Museum educators lead the program. If teachers wish to stay longer than one hour, they can choose to book a second program, book the Paleo Pit or they can take the students into the Public Gallery themselves, before or after the program.

On arrival, students are taken to the auditorium where they are introduced to the program leaders and the Museum. Classes of more than 15 students are divided into 2 groups. One group will visit the gallery for the first half of the program, and the Discovery Room for the second half, while the other group visits in the opposite order.

With primary students, it is helpful for the teacher to divide the class before the visit and for the students to wear clearly visible name tags.

It is also important to be on time to give students the maximum time in their program. Late arrivals will usually receive a shortened program.

Program Concepts

Animals need food, water, space and shelter to survive. The Safe and Sound program concentrates on shelter as a need for survival.

Students are introduced to the reasons why animals need shelter and some of the different ways that they find and use shelter.

Learning Concepts

Many animals need to have shelter to protect them from the elements and from predators and as a place to raise their young.

Shelter comes in many different forms and is acquired in many different ways.

Some animals don't need shelter – they have developed other strategies.

Program Content

Discovery Room

Children examine various animal homes and talk about the animals that made and used them. Homes include bird nests, gopher (ground squirrel) tunnels, and beaver lodges. They discuss animals that simply find shelter like snakes, bears, and wolves; and animals that don't use shelter like deer and caribou.

Animal mounts, specimens, pictures and reproductions are used throughout the program.

Gallery

Under the leadership of a Museum Instructor, children find and examine various homes depicted in the dioramas. They discuss different homes for different animals and different habitats.

Background Information

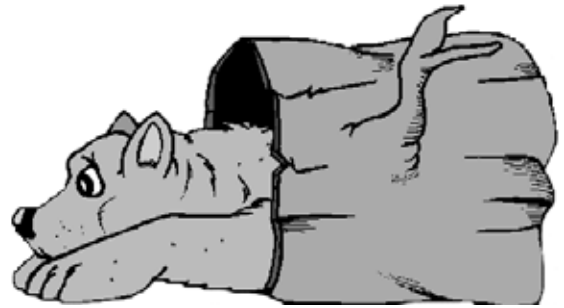
SEASONAL SHELTER

Winter Shelter

Bear's Den

Black bears sleep throughout the winter. They are not, however, true hibernators because their metabolic rate and body temperature do not decrease. They will not eat or drink for as long as six months while sleeping, and cubs are born while in the winter den.

Bears do not create dens – they find them. Dens can be any place that is snug against the cold – a small cave or crevice, or under the roots of a fallen tree.



The den provides a snug place for their winter sleep and also protection for the cubs born during the winter. Cubs are usually born January or February and are tiny and helpless at birth. They grow quickly and can fend for themselves by 6 months. However, cubs usually stay and den with the mother for a second winter before going on their own. Given that a typical litter size is 2 – 3 cubs, the den will be a very crowded place.

Once the cubs are able to move about and find their own food, the den is not needed until the following winter. It is not known if they will re-use the same den or not.

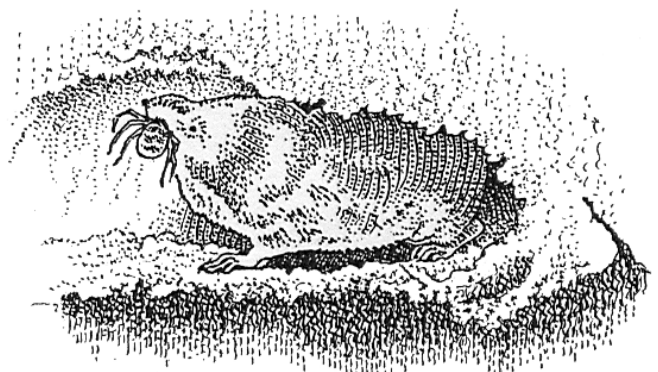
Under the Snow – Subnivean Space

Many animals that are winter active find shelter from harsh weather under the snow. Although we think of snow as cold, it also provides insulation against the cold that animals can use. Many small mammals stay winter active in the layer of dead vegetation at the bottom of the snow called the subnivean space. The temperature in the subnivean space can be more than 20 degrees warmer than above the snow. (check this reference)

Shrews

Shrews are tiny mammals that stay active throughout the year. They have an extremely high metabolism which means they must eat every few hours. Insects and their eggs and pupae form the basis of the shrews' diet, but they are fierce hunters and will also eat earthworms, small mammals, baby birds, frogs, slugs, snails, carrion and seeds. Their high metabolism allows them to stay warm enough to survive the winter.

They make a nest to protect the young and another to keep warm during the winter. The female makes a pile of dried leaves and moss under a tree root or log. She forms the nest material into a hollow ball usually with 2 exits. She may move the young once they are old enough to travel and they do this in a caravan by holding on to the individual in front.



Masked Shrew

Shrews also use nests during the winter to help protect them from the cold. They hunt in tunnels under the snow (subnivean space) where they are protected from

extreme cold and predators. They do slow their metabolism during the winter and spend more time in the nest. During the winter they often eat dormant insects.

In the Snow - Willow Ptarmigan

This bird lives in the most northern part of Saskatchewan. Although it would seem reasonable for birds living in this harsh cold environment to build substantial shelters from the cold, willow ptarmigan rarely use shelter.

Like other members of the grouse family, willow ptarmigan will sometimes use snow as a temporary shelter. They will burrow into a snow bank and sleep within the snow. Sometimes, freezing rain or hard drifted snow will form a crust, trapping the ptarmigan within the snow bank.

Protecting the Young: Bird's Nests

Altricial vs Precocial

Birds fall into two categories. In precocial birds, the young have feathers, are ready to leave the nest and are very active and independent foragers almost as soon as they are born. Other birds have altricial young, which are born without feathers, are helpless and need to be cared for and fed for a few weeks before leaving the nest.

Ptarmigan

In spring, the female ptarmigan makes a nest on the ground in a slight depression which she lines with lichens, grasses, feathers and leaves. She will lay between 5 – 14 eggs. For the next 3 weeks, the female will keep the eggs warm until they hatch. When the eggs are ready, all of the clutch will hatch within a day. The mother does not have to feed the babies which are ready to forage for food within a few days and can fly short distances in a week. The family stays near the nest for the first few days, but will gradually increase the distance travelled in search of food.

Goldeneye Duck

The goldeneye duck has unusual nesting habits. They prefer to nest in a cavity of a tree, such as those formed by broken tree limbs, in the hollow tops of standing stumps or (as shown in the beaver pond diorama), in abandoned pileated woodpecker nests. Goldeneye ducks will nest in man made nest boxes, and prefer boxes with wood shavings and a dark interior.

The female prepares the nest for the eggs by adding feathers from her breast to existing nesting material in the cavity. Females will return year after year to the same nest if they can.

The young stay in the nest only from 24 – 36 hours after hatching. Once their feathers are dry, they can walk and swim and feed themselves. The female coaxes them out of the nest and they “take the plunge”. If the nest is standing in water, they have to swim immediately. The female leads her brood to a different location, which can mean a hike of as much as 10 km. They need lakes that have lots of invertebrates such as aquatic worms and bugs.

Mothers usually remain with their brood until the young can be on their own, but the ducklings must forage for themselves as soon as they leave the nest.



Goldeneye Duck

Golden Eagle

The golden Eagle can be found throughout the northern regions of the world. It is the largest bird of prey in North America. Golden Eagles prefer open hilly country where it can soar high on air currents and have an unobstructed view as it hunts for small animals.

Golden Eagles prefer nesting sites that provide solitude as a protection against predators. Often they build their nest on the side of a cliff or bluff or in large trees. A pair of Golden Eagles may build more than one nest in their territory. They might return and improve on one nest year after year or move to a different one. Nest sites might also be used for many years by different breeding pairs.

Nests are made of large sticks and lined with finer material such as twigs and dried grass. Eagles will repair and enlarge the nest they are using, so a nest can get larger each year. Size varies from about 1 metre in diameter to 2.5 metres for an older nest. The height of the nest can vary depending on where it is built.

Eagles lay from 1 – 4 eggs, with 2 being normal. The female is responsible for most of the incubation, which lasts around 35 days. Unlike Goldeneye ducks, eagle chicks are helpless at birth and stay in the nest for their first 45 to 80 days. They begin to fly when they are about 80 days old and are independent of their parents 80 days later.

Until chicks are independent, the parents are kept busy feeding the brood. As the chicks grow, their demand for food grows as well. If one of the chicks is older and larger than the others, they will often shove the younger ones out of the nest, eliminating competition for food.

American Robin

One of the most common and most noticeable birds in Regina neighbourhoods is the American Robin. Robins are excellent choices to observe nesting habits and may be lured to a convenient spot for easy viewing by providing a nesting platform. Robins like to nest about 3 metres off the ground in a location sheltered from wind and rain and protected from predators. They do not use birdhouses.

The female robin chooses the nest site and builds the nest. She may re-use nest locations and build new nests on top of old ones. She cements twigs, string, grass, bits of cloth and leaves with mud and uses her feet and body to form the cup-shaped nest.

It will take anywhere from 2 – 6 days and an average of 180 trips a day to build a nest depending on the availability of building materials.

Usually in late April or early May, she lays a clutch of 3-4 eggs which are normally the familiar robins-egg blue. Rarely, white or spotted eggs do occur. Incubation lasts for about 12 days and is handled for the most part by the female. She will sit for about 40 minutes, then stand and turn the eggs before flying off for a rest. The male will often stand guard while she is gone and occasionally sit on the eggs himself.



Golden Eagle



At hatching, the young weigh about 5.5 grams and are without feathers and helpless. The parents must work very hard to keep them fed and feed them between 35 and 40 meals a day. They grow fairly quickly, and are usually ready to leave the nest when 13 days old. They will stay in the area for another two weeks, during which time, the male takes the main responsibility of feeding them. They are completely independent of the adult birds at about 1 month of age.

Once the first brood is out of the nest, the female will often lay another clutch of eggs and have a second brood. Where and when conditions are right, she may also have a third clutch. It is not unusual to find eggs in the nest in August.

PERMANENT (YEAR ROUND) SHELTER

Beaver Lodge

Some animals put a lot of work and energy into building a home. These tend to use the home year-round. Some common Saskatchewan animals that stay in one home for the entire year are: Beaver, ground squirrel, prairie dog, groundhog (woodchuck) and muskrat.

Beaver are such good builders they actually change the landscape in order to build a lodge. A pair of beavers will build a dam across a stream to form a pond. They then build an igloo-shaped den in the middle of the pond. This is necessary for a few reasons. Building the lodge in the middle of the pond helps to isolate it from predators. The entrance to the lodge is under water so beavers need to build a pond deep enough to remain unfrozen during the winter to allow beavers to

come and go. The lodge has thick walls made of sticks held together with mud. A small breathing hole is built into the top of the lodge.

A colony of beavers – usually consisting of the pair of adults, newborn kits and kits less than two years of age inhabits the lodge year-round. Kits older than two will go off to establish their own lodges.

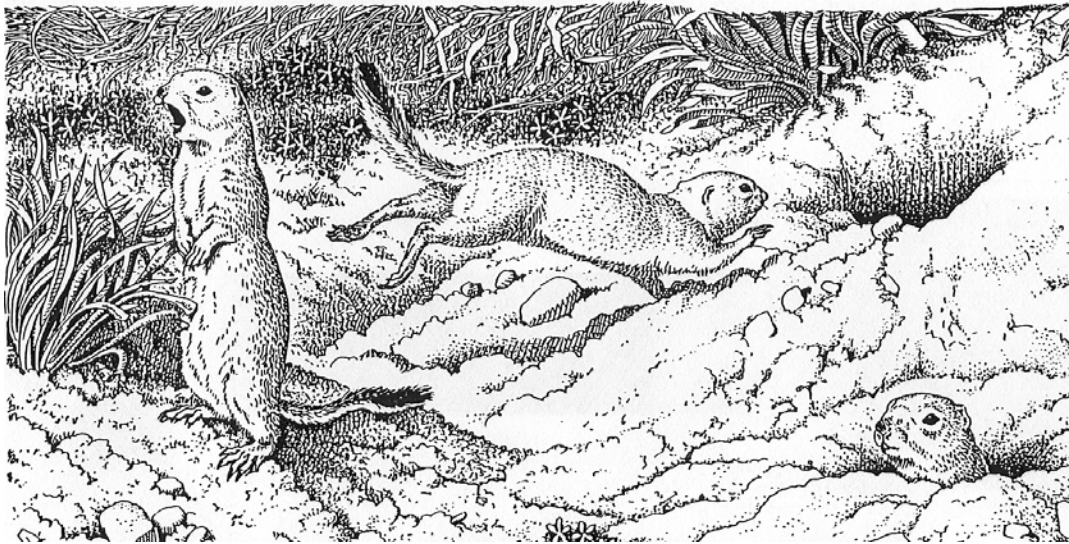
The original pair of beaver will abandon their lodge only when the supply of food in the immediate vicinity runs out. Eventually, the dam will fall apart and the pond will empty, creating a beaver meadow. Trees will gradually move in and re-establish the forest.

There goes the Neighbourhood!

When beavers build dams and lodges, they drastically change the habitat around them. Many animals find their homes flooded and move out. The beaver pond however, creates habitat for many different species. In the gallery, the diorama depicts ducks, plovers, a great blue heron and river otters all benefiting from the changes. River otters especially can benefit because they will often move into abandoned beaver lodges.



Underground



Ground Squirrels

Everyone who has lived on the Northern Plains is familiar with the Richardson's Ground Squirrel. These small rodents live most of their lives underground in an extensive network of tunnels and chambers. They spend most of the year in hibernation underground, sleep underground during their active period in spring and summer, and give birth and raise young underground.

Annual Cycle of Activity

For ground squirrels, the year begins in early spring. The adult males emerge from hibernation first, as early as late February in southern regions. They wake up about 2 weeks before emerging from their hibernation chamber and spend the time eating the cache of seeds that they stored in the chamber the preceding spring and summer.

Adult females emerge about 1 month later. Unlike males, they do not cache food, but emerge when they wake up. Litters are born in an underground chamber in mid April and can be seen above ground starting in mid May.

Adult males go back into hibernation by the last week of June and females follow during the first week of July. This means that adult ground squirrels spend a total of 4 months of the year awake! The juveniles stay awake longer their first year of life – the young females enter hibernation in late August or early September and the young males in mid October.

The times of emergence from hibernation given here are averages for southern Alberta. In more northerly areas, ground squirrels will emerge from and enter hibernation a few weeks later. The total amount of time they are active does not seem to vary north to south.

During the 4 months they are active, the adults are extremely busy. The females give birth, dig tunnels, and raise their litter while the males gather seeds to cache underground.

Females especially will also be working on their burrows. It is common for one female to use two different burrow systems during the active season. Each system consists of long winding tunnels and chambers. A single system will have usually 2 – 3 grass lined sleeping chambers, a lavatory and 5 – 7 exits. The entire system can extend as much as 10 metres and as deep as 1 metre. Females will move themselves and their litter between sleeping chambers and burrows on a day to day basis. Should a female vacate a burrow, others are ready to move in almost immediately.

Although females use extensive tunnel systems, all ground squirrels dig a separate hibernation chamber. This is a simple structure, consisting of a single exit tunnel, a drainage tunnel to ensure the hibernation chamber is dry and a small, grass lined chamber. The squirrel plugs the exit hole at the surface for safety.

NO SHELTER

Barren Ground Caribou – safety in numbers

Caribou are herd animals – they like to live in groups. Living in a herd offers some advantages – there are more eyes and ears to detect predators, animals in the middle of the herd get some protection from the elements and the herd tramples snow, making walking easier. Barren ground caribou are good runners and swimmers and do not need shelter as a defence against predators.

Caribou are well suited to the north – they have large feet that help them to walk in snow. Their hair is hollow which helps them to swim, but also provides extra insulation against the cold.

As with all animals that do not rely on shelter, the young are able to walk and keep up with the herd very soon after birth.



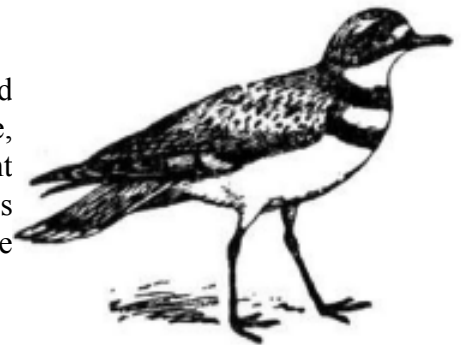
Moose – Only the Lonely

Moose are the largest members of the deer family. Like other deer, they do not need shelter for protecting the young or to escape predation. Moose rely on their size to defend against predators – they do not need the extra protection that living in a herd provides. Young moose are actually quite helpless at birth and the female will nurse the calf for the first few days until it is ready to walk. Once up and going, the calf quickly learns to walk, run and swim. It stays with the mother for the first year of life.

Killdeer

Although Killdeer are good parents, they are bad builders. The nest is a slight depression hollowed out of the ground by the male bird. Sometimes it is lined with grass, woodchips or pebbles. That is as much shelter as Killdeers need.

In April or May, the female lays 4 pear-shaped eggs that are pale beige and speckled or mottled dark black or brown. She arranges them in a neat circle, with the pointed ends in and the wider, blunt ends to the outside. The parent birds rarely leave the eggs unattended. The eggs can be damaged by extremes in temperature, so the parent birds take turns in keeping them warm or in some instances, shading and fanning the nest to cool them.



Eggs take 24 to 26 days to develop and hatch and chicks take from 18 to 36 hours to break free of the shell. The adults remove every piece of shell from the nest as soon as they can.

Young Killdeer dry within an hour of hatching and are ready to run around and hunt for their own food. At this stage, they look like little balls of fluff on two spindly legs. Although the parents do not find food for their young, they watch them continuously and guard them against danger. The parents use an alarm call at the first sign of threat. The young freeze motionless until the parents signal the all clear. As well, the parents give calls to the chicks when it is time to come in from the cold – the chicks will huddle together under the mother's wings and stay warm overnight or for short naps. Chicks are brooded like this for the first days of their life. Chicks lose their downy feathers very quickly and no longer need to be brooded by the time they are 24 days old. They are ready to fly at about 40 days.