



North Dakota 4-H

Nature Trails

Winter Changes



Objectives

You will learn about 1) hibernation, and 2) survival of wildlife.

Introduction

Winter brings many changes. Some of these are hard on animals. The lower temperatures stress animals. They adapt in different ways to handle the cold.

Hibernation (seasonal torpor)

Torpor (pronounced tor-per) is a physical state during which metabolism (digestion), heart rate and breathing slows down. When the animal's body systems slow down it goes into a sleep-like state called torpor. Torpor in the summer is called *estivation*. Torpor in the winter is called *hibernation*.



Winter is often very hard on animals. They must find ways of surviving. Winter torpor also includes *hypothermia*, or the lowering of the body's temperature. Some animals use hypothermia daily and some seasonally. Hibernation is the seasonal use of hypothermia to reduce body temperature.

When an animal gets cold it usually shivers. Shivering is a mammal's way of warming its body quickly. When body temperature lowers during hibernation, shivering is stopped, since shivering takes energy. Mammals need this stored energy during hibernation.

Hibernation can be brought on by a shortage of food, and the onset of cooler temperatures. Body rhythms make some animals sensitive to falling temperatures. Hibernation does not always occur at a set time. Harsh conditions may hurry it and nice weather may delay it.

Hibernation is caused by several things. Sometimes a signal (*stimuli*) causes hibernation to start. Different animals react to different stimuli. The arctic ground squirrel, for instance, reacts to shorter days and cooler temperatures.



Woodchucks hibernate but not always deeply. Other members of this family also hibernate, including the thirteen-lined ground squirrel, Franklin's ground squirrel and Richardson's ground squirrel, as well as the least chipmunk, North Dakota's smallest chipmunk.

Some animals fall into a heavy sleep for several days in winter, and when the weather improves, wake and leave their den. This is not true hibernation. Badgers, for example, often sleep during harsh winters. Several badgers stayed underground for 70 days one winter. Raccoons also sleep during cold winter months. Before sleeping, they begin to store large amounts of fat. They are not considered true hibernators.

Hibernation is different in different mammals. All lower their body temperatures, but they don't all go down to the same temperature. Bats' body temperature gets very low. It is the lowest in deep hibernation. Bats would die in our area when the food supply decreases. Hibernation allows bats live here. By hibernating they can survive with a low food supply. Lower body temperature reduces the need for food.

Animal Winter Survival

There are several ways of dealing with winter. Hibernation and sleeping during the coldest part on the winter are two ways. Denning up is another way. The entrance to the animal's underground den is closed off and the air stays warmer inside the den. Usually the animal has stored up a supply of food.

Sometimes the food is stored in a separate passage of the den. Examples of animals that den are:

- Ord's kangaroo rat
- Pocket gophers
- Prairie dogs
- some mice
- all tree squirrels

Mice avoid cold by sleeping through it. Some scientists think that mice hibernate. Others think that they den up.

Other animals handle winter differently. Pronghorns belong to the deer family. They are named for the distinctive prong of the male's horn. It is a true horn. The core is bone surrounded by a horny cover. Unlike cattle, the horny sheath is shed each year. As winter comes, pronghorn hair lengthens. The hair protects the animal. The coarse hair has a large central air cell. These cells provide a dead air space within each hair that is important for insulation. They keep the animal warmer. The pronghorn can also raise its hair. That also helps insulate it from the cold.



Striped skunks avoid harsh weather by sleeping in their dens. They can only do that for a few days at a time. Tree squirrels also avoid cold by sleeping in their dens.

There is much controversy about whether or not bears are true hibernators. Although their heart rate slows during hibernation, they only lower their body temperature by 9 degrees Fahrenheit. This is a small change. Other hibernators drop their temperature much lower. Bears also wake very rapidly. Other hibernators are very slow-moving when they first wake up.

Bears go into a feeding frenzy in the fall. They gain many inches of fat. The fat is important in hibernation since it can be broken down into energy, carbon dioxide and water. The bear gets all the water it needs by breaking down the fat.



Hibernating bears are studied as part of space research. While the bears are inactive, you would expect their bones to weaken. When we don't get enough exercise our bones lose calcium which gives bones strength. Studies have found that hibernating bears do not lose calcium. Scientists are hoping to find the compound that controls the bone calcium in bears since this might help astronauts survive long space voyages. Astronauts lose calcium from the loss of gravity.

All hibernating mammals have brown fat. Brown fat's job is to produce heat quickly. Some hibernators have brown fat in their neck or shoulders. Bats have brown fat between their shoulder blades. There are two ways mammals wake up during hibernation. One way is to burn the brown fat. This produces energy to wake up the animal. Another way is to start shivering. Shivering warms the body. Then the animal will wake up.

Exercise

Winter Word Find

1. Find and circle the following words:

BADGER
BATS
BLACK BEARS
BROWN FAT
DENNING
GROUND SQUIRRELS

HIBERNATION
HYPOTHERMIA
LESS FOOD
LIGHT
LOW TEMPERATURES
MICE

SIGNALS
STIMULUS
TORPOR
WAKE
WINTER

C L A B X I O T W L H S T U N
H I B E R N A T I O N T V K L
A G L P A R T O N W A O W Y M
D H A P P T I N T T E P X G B
K T C C A R D A E E E C C O F
T A K E A P F A R M R A I Z I
D O B A N N I K T P N D H M J
N O E R W A K E T E A K A K S
T O A O N R X D O R N P N A O
V I R E T N A G E A K N V A P
G B S I G N A L S T E D W B S
M R T K O T R S T U T T Q R T
P O O D G G T R U R N B U H I
A K R U A E I O V E H O F G J
P P P K N B I N H S Y B K N N
O W O I N D T U A V P A P I O
K O R N L E S S F O O D W N Y
P N O K A N I Q E E T G Z N V
L E S V U V S T U A H E C E B
A N V A B A T S K I E R T D E
S I G M A M I N A M R E N O S
L I G N T S M O P S M R P Q R
S I N A L R U A N O I P E A B
P A R T S E L G A Q A U R L C
Q U I N T R U P L A Z K O N S
H A R D T O S T O P N O W X Z

2. Go to a wooded area or marsh. Look for animal tracks in the snow. A wildlife track guide book can help you find out what kind of animal made the tracks. Follow the tracks. Observe where the animal may live and what foods it may eat. Fill out the following chart.

<u>DATE</u>	<u>LOCATION</u>	<u>ANIMAL</u>	<u>SHELTER TYPE</u>	<u>FOOD</u>

Winter Survival for Birds

Some birds *migrate* out of the state to escape the cold winter. Migrate means to move from one area to another. Others move to more heavily wooded areas. Some waterfowl overwinter on the Missouri River. They will stay where there is open water and enough food. The open water needs to be ice-free.

North Dakota is a good winter home for some other birds. These include English sparrows, blue jays, chickadees, finches and other song birds.

Sharptail grouse are birds native to our state. They are widespread over the state. Their name comes from their tail feathers. The tail has two long central feathers. The feathers are much longer than the other tail feathers. Sharptails have a white belly. The white tail and long central feather are important identification marks. Sharptails burrow into snow banks to avoid harsh weather. They also take shelter in woody areas.



A ring-necked pheasant relies on tall grasses or shrubs for winter protection. If such cover is not available, many of these birds will die during harsh winters.

Exercise

1. Observe birds in your backyard. Identify the birds using a bird key book. List those you have observed.

NAME	COLOR	NAME	COLOR

2. Can you tell what they eat? _____

3. Do you feed them? _____

Internet Resources:

Birding on the Internet: Links to other websites
<http://www.ndparks.com/Nature/Birding.htm>

North Dakota Wintering Songbirds
<http://www.npwrc.usgs.gov/resource/1998/backyard/winter.htm>

Hawks, Eagles and Falcons of North Dakota
<http://www.npwrc.usgs.gov/resource/othrdata/hawks/hawks.htm>

Homemade Nest Boxes for Cavity Nesting Ducks
<http://www.npwrc.usgs.gov/resource/tools/nestbox/nestbox.htm>