

Activity: Animals in Winter

Grade Level: Grade 1

Major Emphasis: Seasonal Adaptations

Major Curriculum Area: Science

Related Curriculum Areas:

- Refer to Outdoor Education Curriculum Matrix K-2
- Language Arts
- Career Education
- Human Relations
- Art



Program Indicator:

The student will describe the effects of seasonal changes on animals.

Student Outcomes: The student will:

1. describe the effects of winter on animals.
2. define the words migrator, hibernator and resident and give examples of each. Refer to Figure 1.
3. describe the ways animals are adapted to winter by observing live and preserved specimens.
4. model positive environmental behavior to assist animals in surviving the winter.

Readiness:

1. Introduce vocabulary:

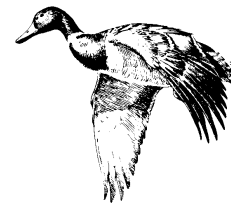
hibernator	West	North	fat	shelter
circulation	migrator	temperature	South	flock
cluster	down	resident	storage	East
heartbeat	den	energy	climate	wing



Resident



Hibernator



Migrator

Figure 1

2. Complete the first grade Unified Science Unit, “Seasons and Seasonal Changes.”
3. Introduce animals through picture cards or study prints.
4. Select and view audio visual materials from the approved list.

Materials:

Residents

- deer skin
- opossum
- raccoon
- squirrel
- muskrat
- fox
- crow
- bees (optional)
- food cards
- appropriate puppets

Hibernators

- turtle (shell)
- black rat snake
- groundhog
- frog
- hibernation puzzle cards

Migrators

- mallards
- Canada goose
- goose wing & tail part
- monarch butterfly
- construction paper cut-outs:
(snowman, sun, letters NSEW, arrow)
- goose call
- field cards NSEW
- compass

Procedures:

Activity A: Hibernators (DL2)

Refer to Instructor Reference Information pages for background information.

1. Observe hibernating animals using descriptions and names.
2. Have students walk on a trail and look for homes of hibernating animals (e.g. groundhog hole in the ground, snake hole in the ground or under rocks). Refer to Figure 2.
3. Discuss the diet of hibernators with students using the groundhog as the example.

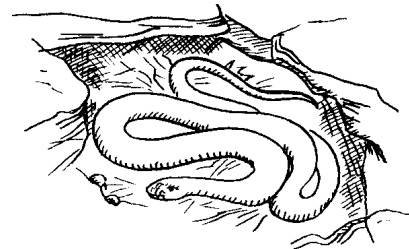


Figure 2: Snake in Hibernation

- a. Discuss with students what a groundhog would do before hibernating including when, what and how much the groundhog would eat.
 - b. Ask the students what the groundhog would look like in the fall and spring. If the two groundhogs are available, have the students compare them in terms of preparation for hibernation.
4. Explain to the students that the body processes of hibernators slow down during hibernation. Have the students clap together, gradually reducing the frequency of claps to demonstrate slowing of heartbeat and breathing. *Students can walk in a circle with the pace and cadence of the hand clapping, gradually slowing down until they reach a slow motion pace.*

5. Have students stand alone and then stand in a close group. In which situation did they feel warmer? When animals stand close together for warmth, we say they cluster. Many hibernators cluster to experience warmth.
6. Have the students role-play by pretending to be hibernating animals. Remind them to include the eating habits and clustering. Use hand puppets to assist the role-play.
7. Complete the appropriate portion of the Animals in Winter Web worksheet using the key words. Refer to Supplement A.

Activity B: Migrators (DL2)

1. Observe migrating animals using descriptions and names. Discuss body parts as they relate to migration (i.e. wings of birds for flight and down feathers for warmth). Have the students handle the bird wing and tail.
2. Use the map, NSEW letters, arrow, snowman and sun to explain and practice fall and spring bird migration.
3. Have students role-play the migration of geese. Refer to Figure 4.
 - a. Locate the direction North on the field by using a compass. Place N, S, E & W cards on the appropriate parts of the field.
 - b. Teach students that the migration of Canadian geese can be recognized by their V formation and their sound. Use the goose call to demonstrate the sounds of geese.
 - c. Have students form a V and make migrating actions and sounds for different seasons. Allow for change of formation leaders and stop for feeding or rest during migration.
 - d. Read and discuss the "Migration Story" if time permits. Refer to Supplement C.

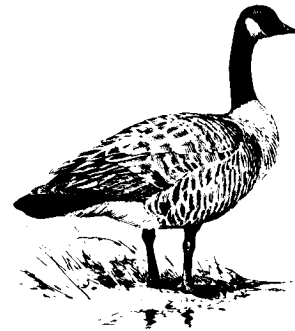


Figure 3: Canada Goose

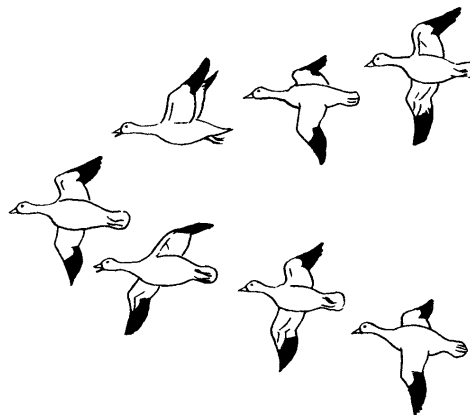


Figure 4: Geese Flying in V Formation

4. Complete the appropriate portion of the Animals in Winter Web worksheet using the key words. Refer to Supplement A.

Activity C: Residents (DL2)

1. Observe resident animals using descriptions and names.
2. Discuss with students the need for warmth during the winter.
 - a. Have students walk on a selected trail and find homes of resident animals (e.g. hollow logs, nests, thickets). Refer to Figure 6.
 - b. Give the students a deerskin and have each student "wear" the skin. Talk with the students about fur and clothing and how animals and people stay warm outside in the winter.
 - c. Some resident animals will herd or group together to stay warm (e.g. deer, bees).
3. Have the students determine appropriate foods for resident animals using the food cards. On each card, have the students identify which foods are available during the winter. Which ones would the animals store?
4. Have students select a resident animal puppet and give a fact about their animal.

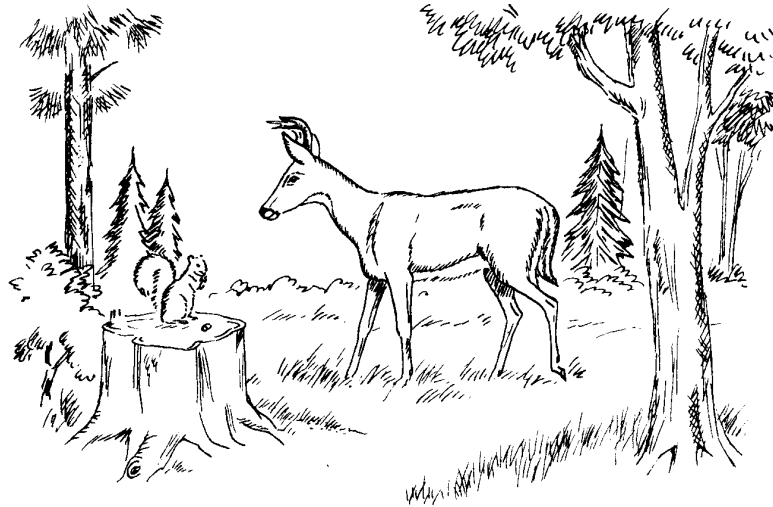


Figure 6: Winter Residents in a Forest

5. Complete the appropriate portion of the Animals in Winter Web worksheet using key words. Refer to Supplement A.

Summary:

1. Using a Venn diagram, have the students compare/contrast the three groups of animals. (DL3)
2. Using the Animals in Winter Web, have the students write or tell a story such as: "If I could be any animal in the wintertime, I would be a _____ because _____." (DL4)

Follow-Up:

1. Have students make a poster to show behavior of animals in winter. (DL3)

2. Using the Animals in Winter Web, have the students paint a mural depicting the different types of animals. **(DL2)**
3. Have students make a diorama showing animals surviving in their winter habitat. Refer to Supplement A. **(DL2)**
4. Have students read and discuss "Migration Story." Refer to Supplement C.

Extension Activities:

1. Have students think about the effects that winter has on their lives. How do they adapt for the winter? Do they change their food, clothes, activities and shelter? **(DL4) (MC)**
2. Play the game "What Animal Am I?" Pin a picture of an animal on the back of a student. Have the student turn so the rest of the class can see it. The student asks yes or no questions to discover the identity of the animal.
3. Have the students make a variety of feeders to help the animals survive the winter. **(DL4&5)**

Teacher Resources:

Books:

- < *Bird Behavior, Callahan. 598.2 CAL.
- < *Birds, Ardley. 598.2 ARD.
- < *Birds, Golden Guide Series.
- < *Ducks, Geese and Swans of North America, Bellrose. 598.2 BEL.
- < *How and Why Wonder Book of Birds, 598.2.
- < *Wonders of Geese and Swans, Febley. 598.2 FEG.
- < *Winter Time for Animals, Cosgrove. 591.5 COS.
- < *Swan Flyway-The Tundra Swan, Limpert.
- < *The Travels of Monach X, Hutchins.

Filmstrips:

- < *"How Animals Get Food," Kit 598.2.
- < *"Seasonal Adventures: World of Plants and Animals," Kit 574.5.

Films:

- < *"Animal Migration," Board of Education #07073.
- < *"Look Around You in Winter," Board of Education #07029.
- < *"Movements and Migration," Board of Education #05606.

Supplementary Materials:

- < First Grade Unified Science Curriculum, Anne Arundel County Public Schools, 1993.
- < *Animal Collection Guidebook, Outdoor Education Program.
- < *Reference Information, Supplement B.
- < *Winter Adaptation Chart, Supplement D.

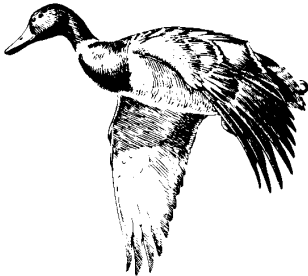
Animals in Winter Web

Label the boxes with the appropriate name: Hibernator, Resident or Migrator. Record at least 2 descriptions of each.



- 1. _____
- 2. _____
- 3. _____

classification



- 1. _____
- 2. _____
- 3. _____

classification



- 1. _____
- 2. _____
- 3. _____

classification

Instructor Reference Information

Migrators, Hibernators, Residents

Migrators

Migration is the movement from one area to another in response to an unfavorable environment during a portion of the year. Animals cannot control their environment, so they move from area to area to find food and shelter needed for survival.

Animals migrate to where food is plentiful and to find the best area to breed and raise their young. Birds build up fat reserves to use for energy during migration. Their bodies build stores of fat differently than humans, so they don't become too heavy for flight. The fat burns off more quickly than human fat. It can be compared to efficient high octane fuel.

Many ducks and geese fly in a V formation for their long distance flights. Refer to Figure 7. This formation lowers wind resistance as the birds fly; therefore, less energy is used. Some studies have shown that a flock of geese in V formation can fly 70% farther than a bird can fly alone. Three characteristics of migrators include:

1. moving from one area to another for food.
2. moving from one area to another for shelter.
3. traveling in a V formation to conserve energy.

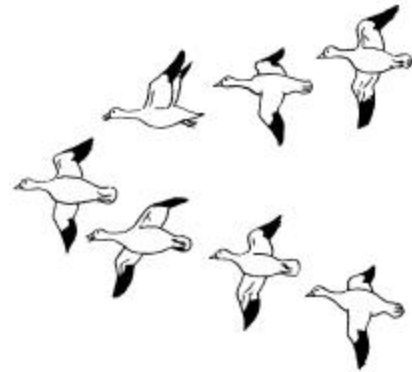


Figure 7: Geese Flying South

Hibernators

Hibernation is a sleep-like state that protects animals from winter cold and reduces their need for food. In cold weather, animals lose heat to the environment more quickly than in the summer. If an animal remains active during the winter, it needs large amounts of food energy to keep its body temperature up. Since food is often harder to find in the winter, hibernation solves this problem.

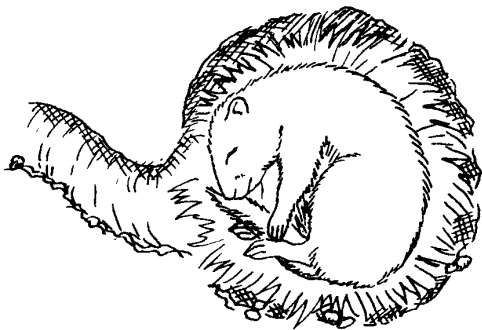


Figure 8: Groundhog in Hibernation

Animals that hibernate are cold blooded and/or their source of food is unavailable during the cold winter months. The most well known true hibernator is the groundhog. Supporting a hefty girth by the time the frosts of October come, the woodchuck retires to an underground den for the winter. Its body temperature drops from 90EF down to the low 40EF and its heartbeat from 100 beats per minute down to approximately 4! In this state, the woodchuck can survive the freezing temperatures and the lack of food in winter. Refer to Figure 8.

Below freezing temperatures pose additional problems for cold-blooded animals who match their body temperature to that of their surrounding environment. To avoid freezing in the winter, reptiles and amphibians seek shelter in soft earth below the frost line, protected hollow logs, piles of debris or at the bottom of ponds. Snakes frequently curl up under rock outcrops and have been known to congregate in a den over the winter. Turtles and frogs bury themselves in mud and debris at the bottom of ponds. Breathing through their skin rather than their lungs, these animals obtain oxygen from the unfrozen water surrounding them. As with groundhogs, their heartbeats and respiration rates drop to barely perceptible levels. Chemical antifreeze helps to prevent their blood from freezing or clotting. In this way, reptiles and amphibians are able to survive freezing temperatures. Four characteristics of hibernators include:

1. consumption of large amounts of food in the fall that is stored as a protein-rich fat. This fat is later used as the animal's food source during hibernation. Refer to Figure 9.
2. digging or finding a hole/den underground or in a protected area in which to curl up. Animals will often hibernate in groups (clustering) for additional warmth.
3. reduction of body temperature below normal.
4. reduction of breathing and heart rates to extremely slow rates. Therefore, animals expend little energy to stay alive.

Although bears den up and sleep during the winter, they are not considered true hibernators. Their body function rates and temperatures do not fall below normal. Bears will often get up in mid-winter to look for food on a warm day. Chipmunks, raccoons, skunks, porcupines and opossums can also be considered "deep sleepers" or "passive foragers" like the bear.



Figure 9: Groundhog

Residents

Resident animals do not migrate or hibernate during the cold winter months. They must face the problems of staying warm and finding food. Refer to Figure 10.

Resident animals have different characteristics and behaviors which help them survive. Some of these characteristics and behaviors include:

1. growing a thick, warm fur coat for the winter.
2. grouping together (clustering) to conserve body heat.
3. eating stored food or active foraging. Reserves of food enable food storsers to survive difficult winters when food is unavailable. Active foragers adapt their diets to what is available, actively searching for food throughout the winter.
4. limiting their activity and sleeping in the nest or den for several days at a time if the weather is severe. These passive foragers wake up periodically to feed on stored food or venture from their dens in search of food.

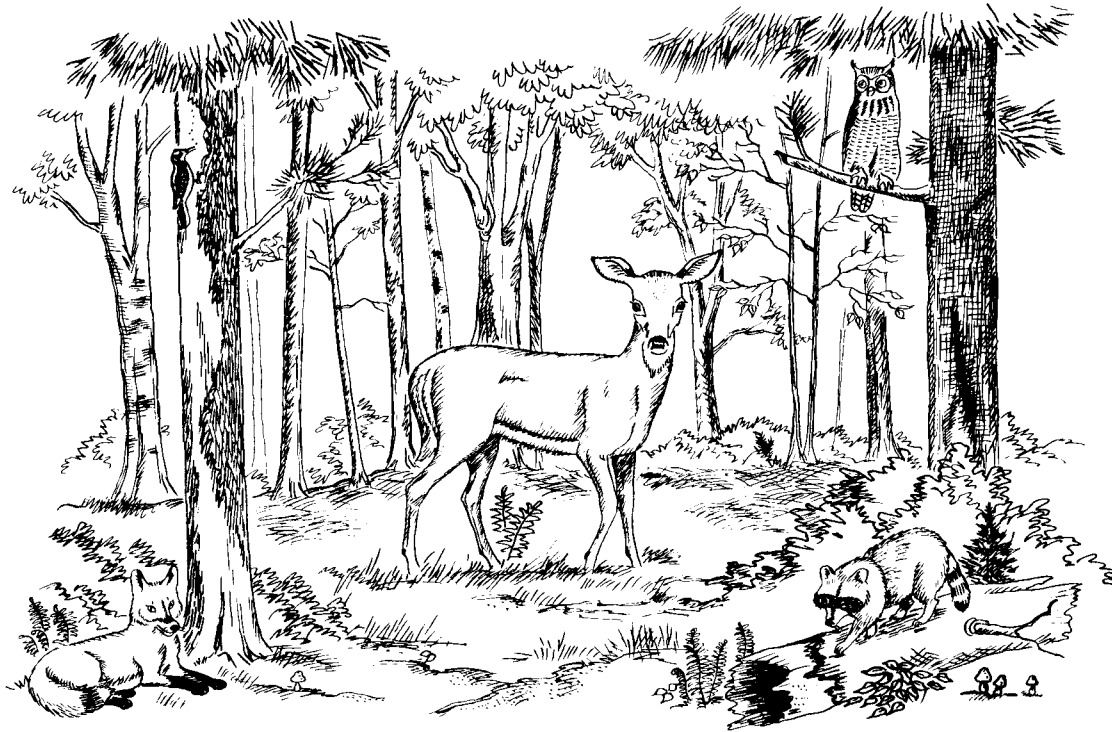


Figure 10: Examples of Winter Mammal and Bird Residents

Migration Story

The birds chirped, the fish jumped and the sun danced across North Lake the morning Jake first explored the lake by himself. Jake was raised on the water. For the past several weeks, he and his brothers and sisters had followed behind his mother learning to swim and eat. Finally, he was ready to swim alone.

Jake poked around the marsh. He stuck his head underwater and found some tasty plants to eat. He floated in the morning sun eating his meal. As he ate, he thought to himself, "I'm so happy to be a duck living here. There's plenty of food to find, water to play in and the days are so warm. I don't think I ever want to leave here."

Jake explored other parts of the lake and even swam out into the deep water, just for fun. Later that day, Jake found his mother and told her about all the things he had seen and done while he was out by himself.

"How was your morning?" she asked Jake.

"I had a wonderful time all by myself. I swam, ate, played and decided that I'm never going to leave our wonderful lake."

Jake's mother looked at him with her kind eyes. "Our lake is a wonderful place to live during the spring and summer when there is plenty of sunshine and food for everyone. But in the fall, the days become shorter and cooler and there are fewer plants and insects for ducks to eat. When this happens, all the ducks will fly south where the days are longer and the weather is warmer. There will be plenty of food for us to eat."

Jake complained, "I love our lake and I won't ever leave here. If it gets colder, I will fluff up my downy feathers to keep me warm."

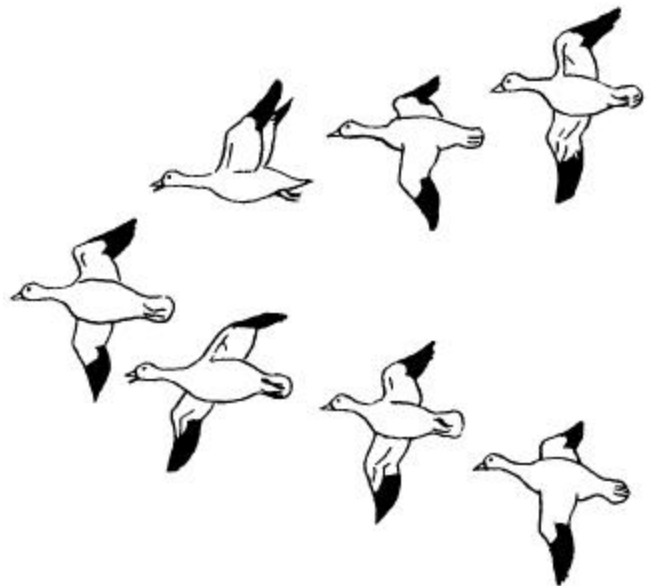
"You will understand," Jake's mother explained, "when the fall comes. Your fluffy down feathers will keep you warm but food will be hard to find."

Jake was stubborn, "I love our lake and I won't want to leave."

Jake's mother smiled patiently and said, "We will see when the fall comes. Jake, I think I see your friend, Jen. Why don't you swim along now and see what she's doing?"

Jake paddled over to visit his friend, Jen. "Hello Jen. Isn't it a beautiful day on the lake?"

"Hello Jake. I was looking for you this morning. I found a great little secret cove and I want to show it to you."



"Can you take me there now?" Jake asked.

"I was hoping you would ask," Jen replied. And then Jake followed Jen across the lake to the secret cove.

Jake and Jen spent many of their summer days exploring, feeding and playing on the lake. As time went on, the days grew shorter and the nights grew colder.

Then one cold morning Jen said, "Jake, the days are getting shorter and cooler. There aren't as many of our favorite insects in these shallow waters. Soon, all the ducks will migrate south where it is warmer and food is easier to find."

Jake asked, "Migrate? What does that mean?"

"It means that we fly south, away from the cold weather here in the north, to another lake or bay where there is more food during the winter. Ducks, geese, swans and birds of all different kinds fly south in the winter to a place where living is better."

Jake answered, "I'll figure that out when the time comes, but I'm not leaving this lake." And with that, Jake swiftly swam away, leaving Jen sad and lonely on the shore.

The whole next week the ducks ate as much as they could so they would have enough energy for the migration flight south. Jake and Jen watched each other from across the water, but neither spoke.

Finally, the day arrived for the ducks to leave. "Are you sure you won't come with us?" Jake's mother asked.

"No," said Jake. "My down will keep me warm and I'll find food somehow. I am happy here at this lake."

"Very well then," said Jake's mother, "I'll see you next spring." Jake's mother turned and flapped her wings and off she flew.

Jen approached Jake. "Good-bye, Jake. I hope you will change your mind." She waited for Jake to answer.

Jake replied sadly, "Good-by Jen."

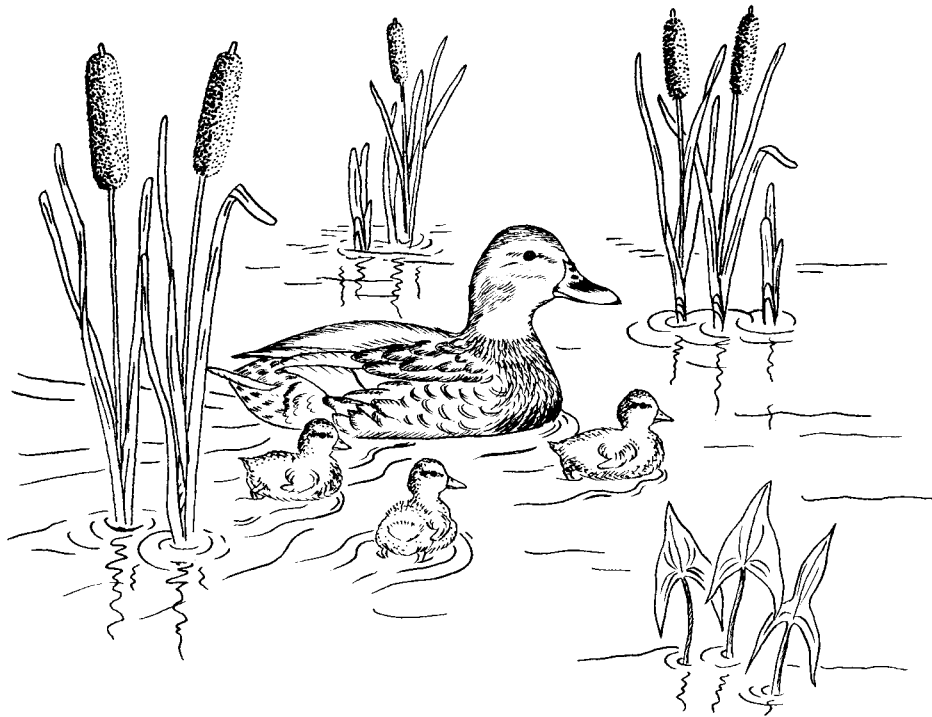
Jen swam a few yards and then took off to join the other ducks in their migration flight.

Jake watched his family and friends climb higher in the sky. All around him the lake was still and quiet. The ducks in the sky now looked like small dark shapes. Suddenly, Jake could stand it no more! He ran across the water flapping his wings. He flew as fast as he could and soon joined Jen and the other ducks flying south.

"Well, after all," he explained to Jen, "we can come back to our lake again next year."

Questions for Discussion

1. Where did Jake, Jen and Jake's mother live?
2. Why did Jake like the lake?
3. When do the days get shorter and cooler?
4. In the fall, where were the ducks flying?
5. What did Jake say would help keep him warm in the winter?
6. Why did the ducks have to fly south?
7. What is the best time of the year for the ducks to live at the lake in the north?
8. Have you ever watched birds flying south for the winter? How were they moving? Did they make any sound?



Winter Adaptations Summary Chart

Animal	Winter Behavior	Classification	Food Source	Winter Habitat	Sp Adap
Black Rat Snake	Hibernator	Reptile	small rodents and birds	digs hole below frost line or protected area under rocks	<ul style="list-style-type: none"> • cold blooded - Body temp extremely as environment • may hibernate in groups
Canada Goose	Migrator	Bird	aquatic plants, grains, grasses, bread	ponds, coastal waters, agricultural fields, golf courses	<ul style="list-style-type: none"> • migrates from Canada as 1 • flies in energy efficient V • adapts to living with ma fields
Canvasback Duck	Migrator	Bird	aquatic plants and insects	lakes, bays and estuaries	<ul style="list-style-type: none"> • migrates in V or line form • has artery-vein structure : warms cold blood returni them to remain swimming
Crow	Active Forager (Resident)	Bird	Omnivorous: seeds, insects, worms, carrion, grains, garbage	woodlands, fields, suburbs, shores	<ul style="list-style-type: none"> • adapts well to living with • migrate but are able to find are
Fox	Active Forager - Food Storer (Resident)	Mammal	Omnivorous: small mammals, birds, nuts, grasses, fruits, insects	protected area den, may enlarge abandoned groundhog den	<ul style="list-style-type: none"> • changes diet to fit the sea • blood pressure and circula nose & ears to prevent fro • tail becomes furry & serv den • remains in den several da • stores caches of surplus 1
Groundhog	Hibernator	Mammal	grass, buds and other vegetation	digs underground burrows with several chambers	<ul style="list-style-type: none"> • feeds heavily on vegetatio • fat layer • curls up in groups in den 1
Honey Bees	Food Storer (Resident)	Insect	honey	hive	<ul style="list-style-type: none"> • clustering-reduce the nur • huddle around the queen • make a surplus of honey c • collecting months to cons

Winter Adaptations Summary Chart

Animal	Winter Behavior	Classification	Food Source	Winter Habitat	Special Adaptations
Monarch Butterfly	Migrator	Insect	milkweed and other plants	Texas, California and Florida	<ul style="list-style-type: none"> migrates in flocks to warmer climates clusters and flies in groups for warmth tricked into thinking monarch flock eggs hatch in spring; caterpillars die in winter north individually, stopping along the way
Muskrat	Food Storer (Resident)	Mammal (Rodent)	Omnivorous: aquatic and terrestrial plants, also frogs, clams, crayfish	builds lodge in water out of branches and plants, traps air inside	<ul style="list-style-type: none"> when it is too cold to leave the lodge, it will eat the plants stored in the lodge
Opossum	Passive Forager (Resident)	Mammal (Marsupial)	Omnivorous: nuts, small mammals, frogs, seeds, carrion	hole in tree, under fallen tree, abandoned nest or den	<ul style="list-style-type: none"> will eat almost anything including ; may sleep in protected area during winter tips of ears and tail may become frozen
Raccoon	Passive Forager (Resident)	Mammal	Omnivorous: nuts, fruits, mice, eggs, crayfish, frogs, garbage	hole in tree, crevice, abandoned groundhog or squirrel nest	<ul style="list-style-type: none"> able to find food in winter since they can smell may stay curled up in their nests, survive severe cold spells
Squirrel	Active Forager - Food Storer (Resident)	Mammal (Rodent)	nuts and seeds	nest built of leaves and twigs or in hole in tree	<ul style="list-style-type: none"> buries nuts and seeds in the fall does not remember where nuts are buried sense of smell (can smell nuts through snow) sleeps in nests for warmth and to conserve energy
Turtle	Hibernator	Reptile	green vegetation, fruits, vegetables	digs into mud, under rock or log	<ul style="list-style-type: none"> cold blooded - needs external warmth
White-tailed Deer	Active Forager (Resident)	Mammal	grasses, leaves, buds	forest edge, meadow	<ul style="list-style-type: none"> clustering - gather together in "deer groups" making walking easier and helps u group to stay warm, movement limited adapt their diet in winter to evergreen warm fur insulates