

How Do Animals Survive Winter?

Age: K-6th grade

Objectives: Help students learn to think about adaptations and how they help animals survive.

Materials: Copies of *How do Animals Survive the Winter?* sheet and *Who Is Where in Winter* Chart

National Science Education Standards:

Content Standards – Grades K-4

- Characteristics of Organisms

- Organisms and Environments

Content Standards – Grades 5-8

- Adaptations of Organisms

Directions:

I. Ask Questions and Discuss Hibernation with Students

II. Look at Hibernation Poster together

III. Have students make a Hibernation Chart

I. Ask your students questions about hibernation and discuss the some answers.

Mammals

Mammals have adapted in many ways to survive the cold winter months.

One way to survive the winter is by **hibernation**. Hibernation is when an animal goes into a deep sleep. The heart beat and breathing slows down. The body cools down. They don't eat food or drink water.

1. Why do animals hibernate? Animals use up their body's fat much more slowly when they hibernate than if they were awake and moving around. In winter there is little or no food available. They have to put on a lot of extra weight in the fall to have enough fat stored for winter, but that is when the food is available.

2. How do animals know when to start hibernation?

Animals begin hibernating for two reasons. Some begin when the days grow shorter in the fall.

Some begin when the days get colder. If an animal waits to hibernate until it gets cold, it can keep eating until then. During a very mild winter, it might not have to hibernate at all.

3. Are all mammals that sleep a lot in winter hibernating?

There are different kinds of hibernation. Some animals are true hibernators. This means their body cools way down. They don't move for days or weeks. It's hard to wake an animal in true hibernation. This can be dangerous if a predator attacks. That's why true hibernators find a safe den before they sleep. Some true hibernators are chipmunks, woodchucks, bats, turtles, frogs, toads, salamanders, and snakes. A woodchuck is the biggest true hibernator. It's temperature drops from 98° to 40°. Its heartbeat slows from 80 beats per minute to just 4!

Some animals don't really hibernate but go into a deep sleep called **torpor**. Torpor can last for a few days or just a few hours on a very cold night. Their body does cool off, but not as much as hibernators. In torpor an animal can wake up in case of danger. Only warm-blooded animals can use torpor to survive the winter. Animals that go into torpor are black bears, raccoons, skunks, some mice and birds. Black bears can sleep for 6 months. They don't eat or drink. Females can give birth in their den during the winter.

4. Do animals just hibernate in cold climates?

Sometimes animals hibernate to survive hot, dry weather instead of cold. This kind of hibernation is called **estivation**.

A lot of animals survive the winter by staying active the whole time. They grow a layer of fat and warmer fur.

The short-tailed weasel and the snowshoe hare adapt to their winter habitat by turning white to blend in with the snow. Other mammals that are active all winter are shrews, mink, voles, foxes, grey squirrels, and red squirrels.

5. What are some ways mammals that don't hibernate can stay alive all winter?

- Beavers and squirrels, store lots of food they can eat all winter. Deer and rabbits search for food under the snow. Shrews, mink, weasels, fox, owls and hawks hunt all winter.
- White-tailed deer gather together into a deer yard sheltered by evergreen trees to wait out the coldest times.
- Many animals change what they eat in the winter. Shrews eat fruit, mushrooms, insects and small animals in the summer. In the winter, all they eat is animals.

Insects

6. What are some ways that insects survive the winter?

- Some insects also hibernate. Their hibernation is called, diapause. They start when the days get shorter. This starts on just about the same day every year, no matter what the temperature.
- Some moths and butterflies survive the winter in a cocoon or chrysalis. In the spring they hatch out as adults. Some stay in their caterpillar form, like woolly bears, and dig under dead leaves or the dirt.
- Some insects survive the winter as adults. They stay in a dry place, out of the wind, inside a rotten log, under dead leaves or burrowed into the soil. Their blood changes and keeps them from freezing. These include ladybugs, wasps, mourning cloak butterflies, and honey bees.
- Some insects dig into plant stems and form a big swelling called a gall. This keeps them safe from cold and snow until they dig out as adults in the spring. You may have seen these galls on plants in your yard.
- The Monarch butterfly migrates to warm climates for the winter.
- Most insects don't survive the winter. They lay eggs in the ground or the bark of a tree and then they die. In the spring the eggs hatch and the cycle starts again.

Reptiles and Amphibians

7. What are some ways that reptiles and amphibians survive the winter?

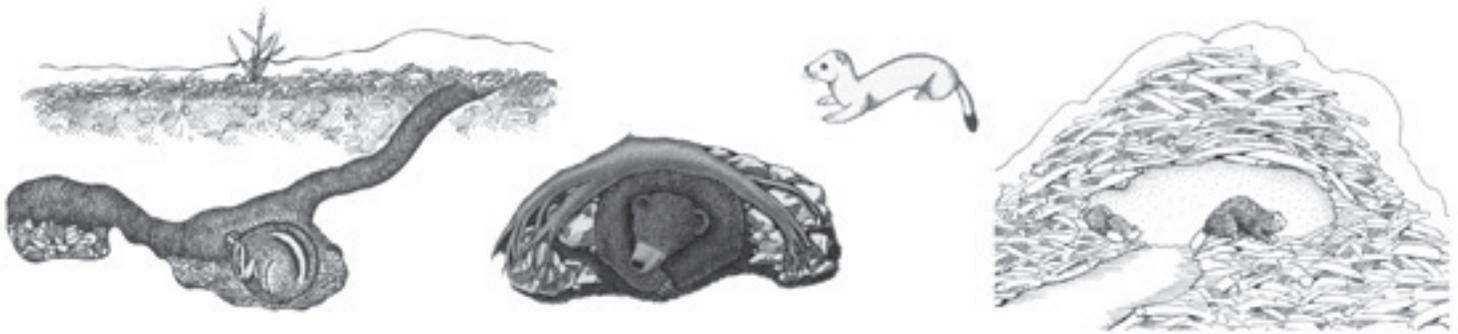
- Cold-blooded animals, like reptiles and amphibians, also hibernate when the days grow shorter. They burrow into the mud at the bottom of their pond or lake. All winter they sleep and take oxygen from the water into their skin. They need the warmth of their environment to heat their bodies, so they must start hibernating on time. If they're caught out on a freezing day, they will die.
- A few frogs like spring peepers, tree frogs and wood frogs spend the winter buried under dead leaves on the forest floor. Their blood changes so that they won't freeze easily. Snow on top of the leaves also helps keep them from the freezing air. On the first warm day of spring the peepers come out and start singing.

Birds

8. What are some ways that birds survive the winter?

- Many birds survive the winter by going south to warmer places. This is called migration. Most birds migrate south.
- Yet some birds can stay north in the cold, like grouse, wild turkeys, chickadees, hawks, and owls. They grow warm winter feathers. What birds near you can be seen all winter?
- Grouse burrow into a snowdrift during cold spells and use the snow to protect them from the freezing air. This is called a snow roost.

How Do Animals Survive Winter?



MAMMALS have adapted in many ways to survive the winter. They hibernate or just sleep a lot more to save energy. They store more food in their dens or change what they eat all together to foods available in winter. They put on more fat, grow thicker fur and even change color to blend in.



Many **BIRDS** can survive winter in the north, growing warmer feathers or fluffing out to stay warm. The rest fly south to warmer climates for the winter months.

INSECT hibernation is called diapause. They find a dry place, out of the wind, inside a rotten log, under dead leaves or burrow into the soil and their blood changes and it keeps them from freezing. Some pass the winter as pupa in cocoons, chrysalis or protected inside a gall. Monarch butterflies even migrate south, though most adult insects lay their eggs and die before winter comes.



Some **REPTILES** and **AMPHIBIANS** burrow into the mud at the bottom of a pond and hibernate until spring. They can get the oxygen they need from the water right through their skin. While others bury themselves under dead leaves on the forest floor, the snow on top protecting them from the freezing air. Even their blood changes so that they won't freeze.



How Do They Survive Winter?

DESCRIBE HOW THEY SURVIVE	Stay North and Stay Active	Stay North and Hibernate	Stay North and Sleep More	Lay Eggs and Die Before Winter	Migrate South	Change Diet or Store Lots of Food	Form a Cocoon or Chrysalis	Grow More Feathers and Fluff Out
chipmunks, woodchucks, bats, turtles, frogs, toads, salamanders, and snakes								
black bears, raccoons, skunks, some mice and birds								
insects like grasshoppers, mosquitos and black flies								
lynx, weasels, wolves, fox, coyote, deer and mink								
owls, wild turkeys, hawks, jays, grouse, etc.								
butterflies and moths								
beavers, red and gray squirrels, shrews								
most song-birds, like humming-birds, robins, swallows, etc.								