



Welcome to our e-Newsletter!

We hope you enjoy SJMA's newsletter created solely for educators - whether you teach in the classroom or outdoors, this newsletter is for you! In each monthly issue, you will receive helpful information on natural and cultural resources found in the Four Corners area, as well as field and classroom activities to do with your students.

The San Juan Mountains Association is the educational nonprofit partner for San Juan National Forest and Bureau of Land Management. If you received this newsletter and do not wish to continue receiving it, send an "unsubscribe teacher newsletter" email to gabi@sjma.org. If a friend or colleague sees this newsletter and is interested in receiving it, please have them send an email to gabi@sjma.org.

Surviving the Winter:

Tips from the Natural World

As the temperature in Colorado grows colder and colder this month, we humans 'adapt' to these changes in a couple of ways to stay warm – by putting on more clothing, and turning up the thermostats in our houses and work places. Most animals, however, don't have this luxury, and must make different changes in order to survive the winter.

Migrate, Hibernate, Adapt or Die!

There are four main ways that animals deal with the winter – they can migrate, hibernate, adapt, or simply die.

Migrate - Birds and other animals may migrate to warmer climates in order to survive when temperatures start to drop. Their bodies have physiological adaptations to allow them to travel long distances and find their way, sometimes to places they have never been before. Many times the reason they are migrating is because their food source is not as available during the winter months. In addition to birds, ungulates (hoofed mammals) such as deer and elk migrate to lower elevations in the winter, as they are not well adapted to deal with the deep snow that occurs in the higher country. Insects will also migrate, including monarch butterflies which may travel from Canada to Mexico to spend the winter.

Hibernate - Hibernate - Many animals stay in essentially the same areas, summer through winter, and must adapt to the changes that occur around them. One of the most commonly known ways that animals adapt to living with the cold is hibernation. When animals go into hibernation, their bodies lower their heart rates, respiration, and body temperatures, allowing them to get through the winter while using up little of their energy supply. There is some discussion about when 'real' hibernation occurs. Generally though, smaller animals such as ground squirrels, bats, jumping mice and marmots are

considered hibernators. Marmots are able to change their heartbeats from a normal 100 beats per minute to a hibernating 15 beats per minute, and only take a breath every 5 or 6 minutes! It is very difficult to awaken a hibernating animal. Bears can go for months without eating, drinking, urinating or defecating, although their body temperature stays about the same, making some scientists stipulate that they are not actually hibernating. They can also be more easily awoken from their 'winter sleep'.

What about cold-blooded animals, such as insects, fish, amphibians and reptiles? Some insects like earthworms and termites will burrow themselves deep into the soil to spend the winter. Frogs, turtles, and some fish will overwinter in the bottoms of lakes and ponds, hiding under leaves, logs, other plants, or even burying themselves in the mud. Frogs are able to breathe in oxygen and exhale carbon dioxide through their skin, and thus stay alive under water for months at a time. Turtles, on the other hand, take in water through their mouth and cloaca, where the skin in their throat and cloaca is able to take in oxygen and get rid of carbon dioxide. Some amphibians, if they don't go under water, will burrow themselves underground – an American toad will bury itself 3 feet below the surface!

Adapt – There are ways other than hibernation that animals can adapt to the winter as well. Some insects spend the winter as larvae or pupae, and others, such as honeybees, will nest in large colonies where they are able to keep warm. Snakes can be found in large groups in a den to stay warm through the winter, and ptarmigan are also known to huddle together against the cold. There are even some insects that will stay active during the winter, if they can find food and stay away from areas of frost. These may include the winter stone fly, crane fly, and springtails (also called snow fleas or collembola).

Many mammals stay active throughout the winter as well. These animals usually will grow a denser coat of fur and an extra layer of fat to be able to survive winter's harsh cold. Some animals will even change colors with this new coat of fur, changing from brown or grey to white, including ptarmigan, snowshoe hares, and long-tailed weasels (see winter camouflage activity below). Some animals may have stored food during the fall that they will then feed from throughout the winter. Other animals will limit their activity for several days at a time, staying in their den or nest until the weather becomes less severe. Pikas remain active all winter in their dens beneath the rocks. They feed on hay, which is grass that is cut, hid and dried during the summer. Their bodies are also adapted to living with the cold, having small, round ears, short legs, and extra fur on their feet.

Die - Some animals just don't make it through the winter. Most animals that may die during the winter simply haven't prepared their bodies or their environments (including food supply) enough to survive. With others, it's just the way nature works. This is true for many insects who lay eggs just before winter begins. They then die during the winter, but their offspring, their eggs, survive the winter and go on to be the next generation of insects.

Classroom Activity - What do they Do in the Winter?

Topic: Wildlife have various ways of dealing with winter changes in their environment.

Preparation: Read background information. Gather materials and place props and signs around the room.

Materials: 6 pieces of white sheet (to be used as a cape), brown fabric large (representing soil) enough to cover 6 students at a time (may want a few pieces of this depending on how you set up the activity), pillows representing rocks, signs: North, South, Hive, Cave, Mountain, Valley, Pond (note: if your students are unable to read, use N for North, S for south, and draw pictures for other signs)

Procedure: Go through the background information with your class. If your students are older, you can first have them research the animals to find out what they do in winter. Divide your class into 5 groups. Explain that each group will be assigned an animal to 'become'. As a group, they must decide what that animal does in the winter, then they will demonstrate that behavior. Remind them that there are four main things that an animal may do in winter: migrate, hibernate, adapt or die. Tell them that there are various signs and props around the room that they may use to demonstrate what their animal does, and point out where and what they are. They can also pretend that other items are present that will help them deal with the winter, such as food. After they have gotten into their groups, assign each group an animal (see below for list of animals). Give them 30 seconds or so to decide what their animal is going to do in the winter. Then tell

them that the winter wind is blowing in, it's getting colder... and to 'Go!'. After each group has demonstrated what their animal does, have them explain it to the rest of the class. Next, reassign each group a new animal, and follow the same steps as before. Using the list below, you can do this one more time (without repeating an animal), or if you come up with other animals, as many times as you wish.

Animals in winter:

- Long-tailed weasel – change colors from brown to white. Students will cover themselves with white sheets
- Canada goose – students will migrate from the north side of the room to the south
- Elk – students will migrate from the mountains to the valleys
- Frog – students will go to the pond and burrow themselves into the soil under the water
- Salamander – see frog
- Fish – students will go to the pond and 'burrow' themselves under vegetation in the water
- Bear – students will first eat a lot of food, then find a 'cave' in the room, and hibernate
- Marmot – see bear
- Lizard – students will burrow themselves under soil or rocks
- Monarch – students will migrate from the north side of the room to the south
- Bees – students will find a 'hive' in the room, and will huddle together for warmth
- Fly – students will lay eggs, then die
- Japanese beetle – students will burrow themselves into the soil
- Pika – students will gather grass, then will hide themselves under rocks, staying active throughout winter, feeding on the grass/hay
- Bluebird – students will migrate from the north side of the room to the south

Field Activity - Winter Camouflage

Topic: One way that wildlife survive winter is by camouflaging with its environment.

Preparation: Cut out and laminate silhouettes of snowshoe hares from white construction paper and brown construction paper. Create more white hares than brown hares. You can choose to draw an eye on the hare if you wish. Scatter these cut-outs either along a trail or in an area in your schoolyard. Note: this activity will work best in the snow, although if there is no snow outside, you can demonstrate how disadvantageous it would be for a white animal to be found when there is no snow.

Materials: Laminated cut-outs of white and brown snowshoe hares

Procedure: Discuss the concept of camouflage with your students. Camouflage is when an animal blends in well with its environment so that it is not easily seen by others. In the winter, some animals in Colorado (and elsewhere) will actually change colors – from brown or grey to white – so that they will blend in better with their environments. Some examples of these animals found in Colorado include: the white-tailed ptarmigan, snowshoe hare and long-tailed weasel. Discuss reasons why animals would change colors like this – if they are prey, they would be less easily seen by predators, and if they are predators, they would be less easily seen by the prey they would like to eat.

Tell your students that they are now going to become predators, looking for snowshoe hares in the snow. Take them to where you have scattered the snowshoe hares in the snow. Tell them their jobs are to find as many snowshoe hares as possible in the next 5 minutes. You can choose to tell them that there are white and brown hares, or let them discover this on their own. You can arrange this activity in various ways – you can have the students stand in one place and count the number of hares they see from one vantage point, or you can have them walk the trail or the field area, counting the number they see, but not picking them up, or you can have this be a contest to see how many hares they can find, and have them pick up the hares as they find them. You can also assign points to the hares, such as 3 points for every white hare, and 1 point for every brown hare. If you have the time to make many hares, this last option is fun for the students, as it turns into even more of a scavenger hunt.

After they have found as many hares as possible in 5 minutes, have them return to the starting point. Ask each student how many hares they found of each color. Ask them if it was easier to find white or brown snowshoe hares, and discuss the reasons why.

Extend the Experience

For more information, check out these websites and books:

- Another fun activity to try where your students simulate bear hibernation by measuring their own heart rate, breath rate and temperature both before and after physical activity (from Idaho Dept of Fish & Game and Project WILD): <http://www.idahoptv.org/dialogue4kids/bears/sleepbear.html>
- Information on bear hibernation: http://www.bear.org/Black/Articles/A_Bear_In_Its_Lair.html
- General information on animals in winter: <http://www.sciencemadesimple.com/animals.html>
- What Do Animals Do in Winter?: How Animals Survive the Cold, by Melvin & Gilda Berger
- Winter Lullaby, by Barbara Seuling

Announcements

SJMA Offering FREE Winter Discovery Walks

This December, January and February, SJMA is offering free, winter discovery walks. These may take place on San Juan Public Lands, or even in your own schoolyard! Contact Alex Prime for more information at aprime@wildmail.com. Space is limited, so reserve your spot now!

SJMA Offering FREE Classroom Presentations

SJMA is pleased to announce a re-vamped classroom presentations program. These fun, hands-on programs can supplement science lessons, or provide additional opportunities for students to practice reading and writing in a variety of ways.

There is no charge for these presentations and all programs are correlated to State Standards. The target age group is kindergarten through fifth grade, and programs typically last thirty to forty-five minutes. Program themes include:

- Tree-mendous Trees
- Fire in the Forest
- Walk the Walk in the Outdoors
- Pumas on Parade

These lessons provide information and interactive activities on forest ecology, flora and fauna of the San Juan Mountains, and "Leave No Trace" principles. Find out more by contacting Gabi Morey - send an email to gabi@sjma.org or call [970-385-1256](tel:970-385-1256).

Junior Forest Ranger Booklets to be Distributed

SJMA has been chosen as one of two non-profit organizations in the country to help distribute a new educational publication from the U.S. Forest Service entitled Junior Forest Ranger. This activity guide takes students (ages 7 – 13) through information and activities on trees, fire, and numerous other topics that impact our public lands. After completion of the activities, children will receive a special Junior Forest Ranger pin and badge, and can be part of the Junior Forest Ranger clubhouse on the web. If you are an elementary or middle school teacher on the distribution list for SJMA's

complimentary conservation education e-newsletter, you will automatically receive a classroom set of Junior Forest Ranger guides this winter! If you do not wish to receive these guides, please indicate this in an email to gabi@sjma.org. Let us know if you would like to request more classroom sets, for additional classrooms, or for non-formal student groups.

Educators—Become a member of SJMA today and receive a 20% off coupon to our bookstore!

Whether you're a 'formal' K-12 school teacher or a non-formal educator, to receive your 20% off coupon valid at any of SJMA's bookstore locations, simply print this or a future newsletter and bring it and your new membership information in to one of our bookstores (Durango, Pagosa Springs, Bayfield or Dolores).

San Juan Mountains Association has been around since 1988. For 18 years, SJMA has been establishing a legacy of caring for the land. Side by side with our members and volunteers, we are helping to ensure the survival of Southwest Colorado's natural glories for generations to come. For more information, visit our website at www.sjma.org, or call [970-385-1256](tel:970-385-1256).

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