Literature Connection

Why do Leaves Change Color?

In a clear text, Betsy Maestro explains the concepts of photosynthesis, pigments, and chlorophyll in terms children can understand. She includes activities children can do with leaves, and even a list of places known for brilliant fall colors that children can visit with their families. There are also detailed pictures of leaves in different sizes, shapes, and colors.

Author: Betsy Maestro
ISBN: 0060228741 (lib. bdg.), 0064451267 (pbk.), 0785756035

The Reasons for Seasons

Gibbons uses simple words and clear, colorful pictures to explain the seasons, the solstices, and the equinoxes. Besides discussing the earth's tilt and orbit, she also comments on what people and animals do in each season of the year.

Author: Gail Gibbons
ISBN: 0823411745

Winter Moon (Seasons of the Moon, Vol 2)

In this series, acclaimed naturalist and Newbery Medal -- winning author Jean Craighead George takes readers on a wondrous journey through each season of the year as she captures the lives of thirteen different North American animals in their natural habitats. Survive an icy night under a December moon with a song sparrow stalked by a midnight predator in Ohio's suburban meadowland. Navigate through underground passageways with a mole in the chilly darkness of December and January beneath the Great Plains of Kansas. Experience January moonlit courtship with a hooting horned owl in the forests of the Catskill Mountains. Prepare for hibernation with a female bear as February's ice crystals replace the dew in the Smoky Mountains of Tennessee.

Author: Jean Craighead George,
ISBN-10: 0064421708, ISBN-13: 978-0064421706

Do Not Disturb : the mysteries of animal hibernation and sleep

An easily read, thorough, and up-to-date exploration of hibernation; estivation (summertime hibernation); and sleep in mammals, birds, and fish. Utilizing the latest research on animal survival in both hot and cold climates, Facklam explains new information clearly and with style. Unfamiliar words are always defined. The process of hibernation as well as its possible value in future space flights are discussed. The three types of hibernation--deep sleep, light sleep, and daily dormancy--are carefully explained with examples.

Author: Margery Facklam
ISBN: 0316273791

Wyoming

Fall & Winter Ag-tivities

wyomingagclassroom.org

Leaves Change Color

Fill in the blanks to compleat the paragraph on why leaves change color. Use the words from the Word Bank below.

(Words can be used more than once)

_____ is the process plants use to make food. The food they make is called_____. To make _____, plants need_____. They also need a chemical called _____._____ gives plants their _____ color. As autumn approaches and days get shorter, plants get less _____. _____ stops and _____ starts to disappear from the leaves. Now other colors also can be seen. The red and purple colors are caused by _____ that was trapped in the leaves when _____ stopped. The_____colors are caused by waste trapped in the leaves. The _____ and _____ colors were always there; they were just hidden by the _____ color of the _____.

Word Bank:

brown
carbon dioxide
chlorophyll
glucose
yellow
green
orange
photosynthesis

Web Resources: Why Do Leaves Change Color in the Fall? http://www.sciencemadesimple.com/leaves.html

Nature of Winter

Science Activities

When Food Freezes

When winter's cold temperatures and ice arrive, food becomes scarce for animals in the wild. Fill ice trays with water and drop a small chunk of fruit or vegetable into each section. Allow the water to freeze. Then pop out the cubes and smell each ice cubes. Can they smell the fruit or vegetable? Try to eat the food chunks out of their ice cubes. How difficult is it in wintry conditions for animals to find and get to food. This is why there is a low food supply for many animals in winter. Hibernating animals eat all summer and fall to fatten their bodies. The stored fat provides fuel to help the animals survive during their winter hibernation, which can last as long as six or seven months.

Conserving Energy

Hibernation not only eliminates the need for winter food-gathering, but also lets an animal conserve its body energy by slowing down its heart rate and breathing. Set a timer during a rest period and take your pulse during a one-minute interval. Write down the results along with descriptions of your breathing during this time. Then in an open area, have them perform vigorous exercises such as jumping, running, and hopping for several minutes. Afterward, sit and take your pulse again. How do the results differ? How does their breathing compare? Does rest or activity require more energy?

Temperature Experiment

While the average body temperature for a mammal is 99ºF, a hibernating animal's temperature drops to around 43ºF. This is less than half the normal temperature and only 11 degrees above freezing! The lower temperature reduces the amount of energy an animal must use to keep warm. To check this out, fill a plastic bucket half way with warm water and measure the temperature using a thermometer. Stir in one ice cube at a time and take a temperature reading after each addition, until the water reaches 43ºF. Then place one of your hands in the water to experience the body temperature of a hibernating animal. Do you think you could sleep comfortably at this temperature?

http://www2.scholastic.com – A Time to Sleep, Exploring the strange and secret worlds of animals' winter habitats

Reasons for the Seasons

The Earth's seasons are not caused by the differences in the distance from the Sun throughout the year. The seasons are the result of the tilt of the Earth's axis. The Earth's axis is tilted from perpendicular to the plane of the ecliptic by 23.45°. This tilting is what gives us the four seasons of the year - spring, summer, autumn (fall) and winter. Since the axis is tilted, different parts of the globe are oriented towards the Sun at different times of the year.

Summer is warmer than winter because the Sun's rays hit the Earth at a more direct angle during summer than during winter and also because the days are much longer than the nights during the summer. During the winter, the Sun's rays hit the Earth at an extreme angle, and the days are very short. These effects are due to the tilt of the Earth's axis.

Solstices are days when the Sun reaches its farthest northern and southern declinations. The winter solstice occurs on December 21 or 22 and marks the beginning of winter. The summer solstice occurs on June 21 and marks the beginning of summer.

Equinoxes are days in which day and night are of equal duration. The two yearly equinoxes occur when the Sun crosses the celestial equator.

1. Name the four seasons.
   _____
2. The Earth's seasons are caused by the _____
3. During which season do the Sun's rays hit the Earth at the most direct angle?
   _____
4. During which season are the days the shortest? _____
5. What is the name of the shortest day of the year)? _____
6. What is the name of the longest day of the year? _____
7. What is the name of a day in which the day and night are of equal duration?
   _____

http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Seasons.shtml

The Language of Autumn

Brainstorm nouns, verbs, and adjectives about autumn/fall. Use these words to help you write two different kinds of poems

_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____
_____ _____ _____

S _____
E _____
P _____
T _____
E _____
M _____
B _____
E _____
R _____

Acrostic Poem

Beginning with a word and write it down instead of across the paper. The first letter of each line is already written and writers must use those letters to form their word or line of verse. The end product should result in a poem that is related to the word that is written down the paper.

Haiku Poems

The haiku is a Japanese poem comprised of three lines. The first line is five syllables, second line is seven syllables and the third line is five syllables. Haiku poems are often, but not always associated with weather and/or the seasons.

_____
_____
_____

Habitat Connection

Winter Survival Strategies

There are three main winter survival behaviors: migration, hibernation, and remaining active in the habitat.

Migration

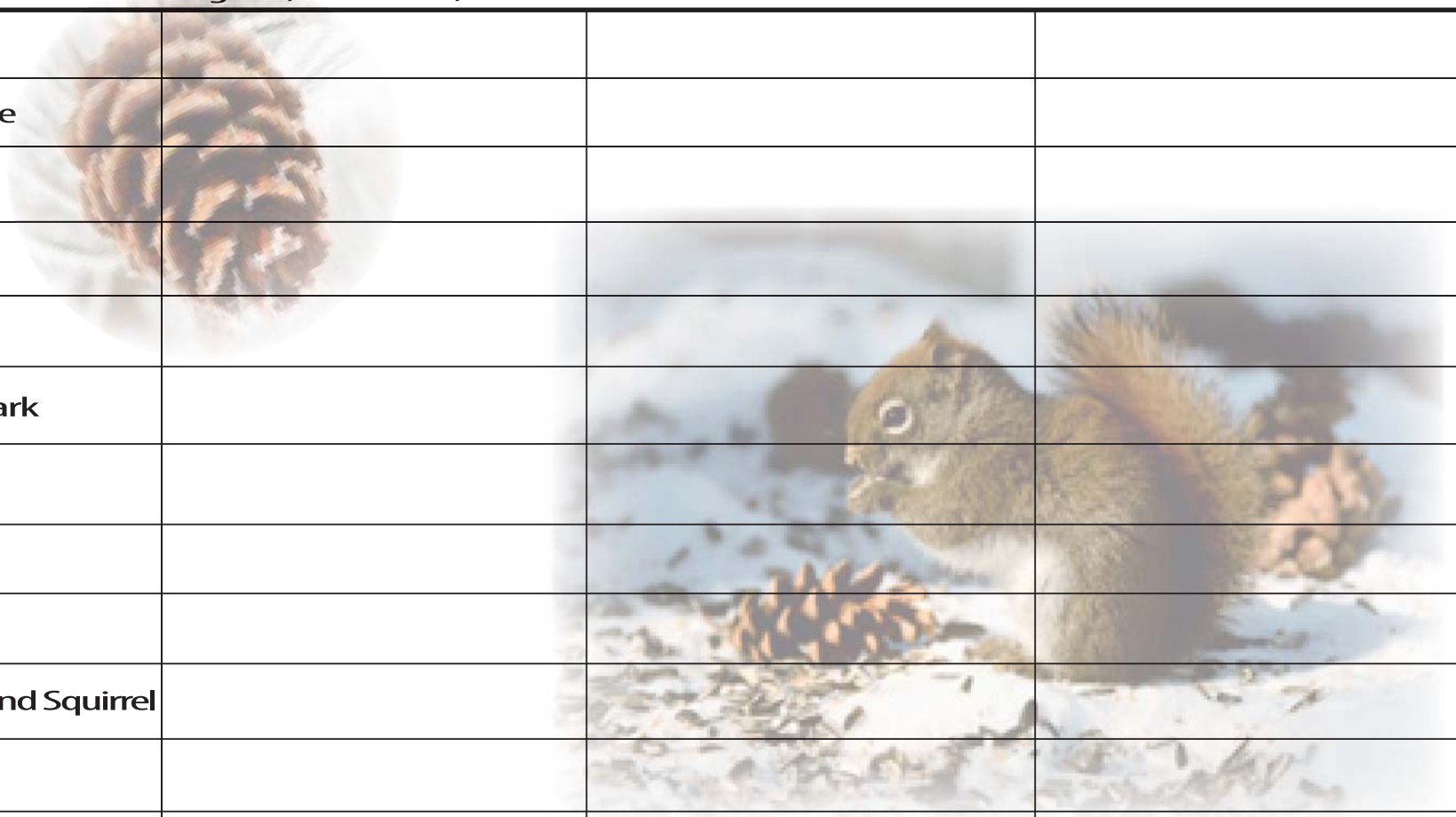
Animals that migrate move from one place to another at specific times every year. As winter approaches, days shorten and temperatures drop. This signals to certain animals that it's time to move. They will go where the weather is milder and the food supply more certain. Migration distances vary. They can range from a short trip between nearby habitats to an overseas trip.

Hibernation

An animal that hibernates becomes less active and sleeps through the winter in a sheltered place. To remain inactive for a long time, the animal uses the fat reserves it built up over the summer and fall. Bears and other animals may add a third or more of their body weight in fat before their winter sleep. A hibernating animal can only sleep as long as its reserves last. If it wakes early and can't find enough food, it may starve. Hibernating animals lower their breathing rate and body temperature, which helps them avoid freezing.

Remaining Active

In contrast to hibernation, many animals remain active to survive the winter. As a result, they may only make a few changes in their appearances and/or their daily routines. For example, an animal may thicken its winter coat. Another animal may produce brown fat, which generates heat as it is broken down inside the body. To remain active, an animal may also change its diet, such as eating a high-fat diet. It may also stock up on extra food before winter begins. Because berries are scarce in winter, a bird may feed on nuts and seeds instead. To save on energy and the food needed to create it, some animals slow their metabolism. Another energy-saving strategy is roosting, or sleeping in groups.



	Migrate, Hibernate, Active?	Winter Habitat	Winter Food Source
Human Being			
Greater Sage Grouse			
Miller Moth			
Cutthroat Trout			
Beef Cattle			
Western Meadowlark			
Big Brown Bat			
Hoary Bat			
Blackfooted Ferret			
Thirteen-lined Ground Squirrel			
Labrador Retriever			
Tiger Salamander			