

A Fat Bear is a Healthy Bear!



Grade Level: K – 2

Standards:

Minnesota Standards in Science Codes

1.4.1.1.1 – Living things are diverse with many different observable characteristics.

1.4.2.1.1, 1.4.2.1.2 – Natural systems have many components that interact to maintain the living system.

0.1.1.2.1 – Scientific inquiry is a set of interrelated processes incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena.

Minnesota Academic Standards in Mathematics Codes

K.1.1.1, K.1.1.2, K.1.1.3, K.1.1.5 – Understand the relationship between quantities and whole numbers up to 31

1.1.1.1, 1.1.1.2, 1.1.1.5, 1.1.1.6, 1.1.1.7 – Count, compare and represent whole numbers up to 120, with an emphasis on groups of tens and ones

K.1.2.1 – Use objects and pictures to represent situations involving combining and separating

1.2.2.1, 1.2.2.4 – Use number sentences involving addition and subtraction facts to represent and solve real-world and mathematical problems; create real-world situations corresponding to number sentences

2.1.1.1, 2.1.1.5 – Compare and represent whole numbers up to 1,000 with an emphasis on place value and equality

2.1.2.4, 2.1.2.5, 2.1.2.6 – Demonstrate mastery of addition and subtraction basic facts; add and subtract one- and two-digit numbers in real-world and mathematical problems

Link Resources:

www.bear.org

www.bearstudy.org

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_300dpi.pdf

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_100dpi.pdf

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_notes.pdf

http://www.bear.org/website/images/stories/education-outreach/resources/Black_Bear_Basics.pdf

Goals:

The student will understand that food is one of the basic needs of survival and that hibernation is an adaptation that allows the black bear to survive when the bear's natural food is unavailable. Black bears have adaptations for obtaining food. Students will use their sense of smell to understand how black bears have adapted a keen sense of smell to facilitate obtaining food.

Curriculum Focus:

Science, math

Lesson:

Background

The hibernation cycle is a unique adaptation of nature that allows many animals, like the black bear, to survive during the severe conditions of wintertime. Animals like the black bear would find it extremely difficult to find enough food during winter, and therefore they go into hibernation, when their body

processes slow down to conserve energy. In Minnesota, where natural food is scarce in the winter, the bears bypass winter and remain, almost exclusively, in their dens for 6 or 7 months. To survive this long period without food, bears gain weight in the months before hibernation. While in hibernation, the bears use the stored energy they accumulated as fat to survive. In Ely, Minnesota (home of the North American Bear Center), the bears generally enter hibernation in September or October and emerge sometime in April or May.

<http://www.bear.org/website/bear-pages/black-bear/basic-bear-facts.html>

<http://www.bear.org/website/bear-pages/black-bear/black-bear-facts/hibernation.html>

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_notes.pdf

Introductory Activities

Hibernation is a way for some animals to survive the changing seasons and environment. It is important for children to understand why black bears enter hibernation during the winter. Animals get energy by consuming food; because there is less food available in the winter, animals enter hibernation to conserve energy and to survive the winter. Bears need to build up their fat supplies prior to entering hibernation by eating a variety of foods. A thick layer of fat helps to insulate bears from the cold, as well as provide stored energy during hibernation.

Fat Mittens: Fill a sandwich-sized Ziploc bag with a layer of Crisco. Explain to the students that the Crisco represents the bear's fat. Have each student insert his/her hand into a latex glove and then insert his/her gloved hand into the bag with the Crisco. Secure the top of the Ziploc bag with a rubber band around the child's wrist. Have the student try to pick up some ice cubes or snow. Explain that the fat layer of the mitten insulates the child's hand from the cold, just like the bear's layer of fat helps to insulate it from the cold. It also provides stored energy during hibernation.

Body Changes: Have the students talk about how hungry they are for breakfast each morning. Explain that food provides energy to be active during the day. Have students run in place; that uses a lot of energy. Point out their body changes: they breathe faster, they get warm, and their legs may begin to tire. Have them feel their heartbeats. Next, have students pretend to be bears in hibernation. When food is not available to provide that energy, the bear adapts and slows down its body processes. Have students lie down and breathe deeply and slowly. Guide the students to notice changes in their bodies: their heart rate slows, they breathe more slowly, and they begin to cool down. Have them imagine what it would be like to breathe only several times a minute. Discuss with students how important food is for bears preparing to go into hibernation for several months.

Preferred Foods: Introduce the children to black bears' preferred foods. The focus should be that the bears are big animals, but their food comes in small packages that vary based on the season, growing conditions, and their geographic location. They are not fierce predators. Video, picture and print resources are available at:

<http://www.bear.org/website/bear-pages/black-bear/foraging-a-foods.html>

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_100dpi.pdf

http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_notes.pdf

Sense of Smell: Black bears' smelling ability is extremely good and is one adaptation bears have for obtaining food. The teacher will mark a number of trees by rubbing an onion on the tree's bark at different heights. Students will be taken to the general area where the trees have been marked. Allow them to smell the scent before sending them out to pick up the scent. When a scented tree is found, students will pantomime a bear ripping apart a stump for ants, eating tent caterpillars off of the tree trunk, eating berries from a bush, etc. Students should be able to verbalize their food gathering activity,

and the adaptation that helps in that activity: sharp claws for climbing, ripping; strength for overturning rocks or bending branches; long sticky tongue for separating preferred foods and reaching into ant colonies.

Activating Background Knowledge and Guided Practice

Students will role-play as black bears foraging food to be on track for achieving a healthy weight going into hibernation.

Getting Started: Print one set of 100 food cards (see below) for every 10 students. Print the cards on green or brown paper (good for camouflage, especially if the playing area is outside), and then laminate them. The cards are designed so that the number of cards in each category reflects the percentage that category plays in an average bear's annual diet. Note: These percentages may vary from region to region. Within a single region, they may also vary from year to year, and within a year they may vary from season to season.

PLANTS	30%
NUTS	30%
BERRIES	5%
INSECTS	10%
MEAT	5%
Total:	100%

After printing and laminating the food cards, scatter the cards within your area (outside, if possible). Wrap each student's hands (4 fingers, minus the thumb) with masking tape, with the sticky side out. This will simulate the bear's sticky tongue.

The Role Play: Your black bears (up to 10 students) all start in a line on the edge of the game area. When the teacher gives the signal, the bears begin to walk, on all fours (hands and feet on the ground) and find food. Students continue foraging, picking up food cards with the masking tape on the back of their hands until the teacher signals for them to stop. Partners can walk along side, just as biologists sometimes walk along with bears. The biologist partners will just be observers, and in this role play, will collect the food cards from the back of the bears' paws (hands). Repeat the process depending on the number of students in the class.

Students count and record the number and type of food cards they foraged on a summary chart, see below. Combine into class summary charts.

Closure

Discuss the activity: what food was eaten the most? The least? Why? What can you conclude about a black bear's diet? How would the change of seasons affect a bear's diet? The teacher can share "A Bear's Life Through the Months" (http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_notes.pdf).

In your discussion, be sure to cover these important facts:

- Berries and nuts are the 'mast crops' needed to put on weight to successfully reproduce.
- Vegetation is important because it is more dependable than crops of berries or nuts, which may fail due to weather conditions.
- Meat is a very small part of most black bear diets.
- Insect larvae/pupae are important, especially ant larvae/pupae. In dry years, when berry crops fail, ant colonies thrive.

Ask students to think about what they learned from the day's activities. Generate a list of things students think they know about black bears, including foods eaten, bears' adaptations for obtaining food, hibernation, and why a fat bear is a healthy bear. This list can serve as an informal assessment to guide further instruction.

Math Extension

Collect the food cards in a paper bag. Have students predict which type of food they are most likely to choose. Make a tally chart that shows 25 choices. How does this tally chart compare to the foraging summary chart?

Created by:

Michelle Sedberry and Helen Schwarz

A Fat Bear is a Healthy Bear



Student Summary Form

NAME OF FOOD	Place an "x" for each card foraged									TOTAL
NUTS										
BERRIES										
INSECTS										
PLANTS										
MEAT										

A Fat Bear is a Healthy Bear



Classroom Summary Form

Student	Nuts	Berries	Insects	Plants	Meat	Total

A Fat Bear is a Healthy Bear



NAME OF FOOD	CLASS TOTAL
NUTS	
BERRIES	
INSECTS	
PLANTS	
MEAT	



BERRY
American fly honeysuckle



BERRY
blueberry



BERRY
bunchberry



BERRY
Canada plum



BERRY
chokecherry



BERRY
common buckthorn



BERRY
cranberry



BERRY
swamp dewberry



BERRY
hawthorn



BERRY
highbush cranberry



BERRY
Juneberry



BERRY
mountain ash



BERRY
raspberry



BERRY
raspberry



BERRY
red osier dogwood



PLANTS
skunk current



BERRY
winterberry



BERRY
blueberry



BERRY
downy arrowwood



BERRY
Juneberry



BERRY
wild sarsaparilla



BERRY
3-leaf Solomon seal



BERRY
pincherry



BERRY
blackberry



BERRY
strawberry



NUTS
acorns



NUTS
acorns



NUTS
acorns



NUTS
American hazelnuts



NUTS
American hazelnuts



NUTS
American hazelnuts



NUTS
beechnuts



NUTS
beechnuts



NUTS
beechnuts



NUTS
hickory nuts



NUTS
hickory nuts



NUTS
hickory nuts



NUTS
beaked hazelnuts



NUTS
beaked hazelnuts



NUTS
beaked hazelnuts



NUTS
acorns



NUTS
acorns



NUTS
acorns



NUTS
acorns



NUTS
acorns



NUTS
acorns



NUTS
pecans



NUTS
pecans



NUTS
pecans



NUTS
walnuts



NUTS
walnuts



NUTS
walnuts



NUTS
pine nuts



NUTS
pine nuts



NUTS
pine nuts



PLANTS
dandelion



PLANTS
sedge



PLANTS
horsetail



PLANTS
large-leaf aster



PLANTS
wild calla



PLANTS
interrupted fern



PLANTS
skunk cabbage



PLANTS
aspen catkins



PLANTS
jewelweed



PLANTS
sweet cicely



PLANTS
clover



PLANTS
wild lettuce



PLANTS
wild calla seed head



PLANTS
grass



PLANTS
new leaves



PLANTS
skunk cabbage



PLANTS
sedge



PLANTS
wild lettuce



PLANTS
large-leaf aster



PLANTS
wild calla



PLANTS
new leaves



PLANTS
wild calla leaves



PLANTS
aspen catkins



PLANTS
clover



PLANTS
jewelweed



PLANTS
clover



PLANTS
interrupted fern



PLANTS
sweet cicely



PLANTS
grass



PLANTS
dandelion



INSECT
yellow-jacket larvae



INSECT
yellow-jacket larvae



INSECT
ant pupae



INSECT
ant pupae



INSECT
grub



INSECT
grub



INSECT
grub



INSECT
grub



INSECT-LIKE
snowfleas



INSECT-LIKE
snowfleas



MEAT
eggs



MEAT
fish



MEAT
small mammals



MEAT
fawns



MEAT
nestlings