

# Become a Bear Scientist

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**Grade Levels:** 1 - 5

## Standards:

### Minnesota Academic Standards in Science Codes

- 1.1.1.1.1, 1.1.1.1.2 - Scientists work as individuals and in groups to investigate the natural world, emphasizing evidence and communicating with others
- 5.1.1.1.1, 5.1.1.1.2, 5.1.1.1.3- Science is a way of knowing about the natural world, is done by individuals and groups, and is characterized by empirical criteria, logical argument, and skeptical review
- 3.1.1.2.1, 3.1.1.2.2, 3.1.1.2.3, 3.1.1.2.4- Scientific inquiry is a set of interrelated process incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena
- 3.1.3.4.1, 5.1.3.4.1: Tools and mathematics help scientists and engineers see more, measure more accurately, and do things that they could not otherwise accomplish
- 1.4.1.1.1, 3.4.1.1.2, 5.4.1.1.1- Living things are diverse with many different observable characteristics that enable them to grow, reproduce and survive
- 1.4.2.1.1, 1.4.2.1.2- Natural systems have many components that interact to maintain the living system
- 1.4.3.1.1, 1.4.3.1.2- Plants and animals undergo a series of orderly changes during their life cycles
- 3.4.3.2.1, 3.4.3.2.2- Offspring are generally similar to their parents, but may have variations that can be advantageous or disadvantageous in a particular environment

### Writing Benchmarks K-5 (Common Core Writing Standards K-5)

- 1.6.2.2 – 5.6.2.2, 1.6.3.3 – 5.6.3.3, - Text Types and Purposes
- 3.6.4.4 – 5.6.4.4, 3.6.5.5 – 5.6.5.5, 3.6.6.6 – 5.6.6.6, - Production and Distribution of Writing
- 3.6.7.7 - 5.6.7.7, 3.6.8.8 - 5.6.8.8, - Research to Build and Present Knowledge

## Link Resources:

### ABC's of Black Bears – book versions:

[http://www.bear.org/website/images/stories/education-outreach/resources/ABCs\\_100dpi.pdf](http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_100dpi.pdf) (low res)

[http://www.bear.org/website/images/stories/education-outreach/resources/ABCs\\_300dpi.pdf](http://www.bear.org/website/images/stories/education-outreach/resources/ABCs_300dpi.pdf)

### Bear Videos:

<http://www.bear.org/website/live-cameras/videos/bear-videos.html>

### Den Cam Archives:

[http://www.bear.org/website/images/stories/education-outreach/resources/EO\\_02-20-10.mp4](http://www.bear.org/website/images/stories/education-outreach/resources/EO_02-20-10.mp4)

[http://www.bear.org/website/images/stories/education-outreach/resources/EO\\_03-01-10.mp4](http://www.bear.org/website/images/stories/education-outreach/resources/EO_03-01-10.mp4)

[http://www.bear.org/website/images/stories/education-outreach/resources/EO\\_03-09-10.mp4](http://www.bear.org/website/images/stories/education-outreach/resources/EO_03-09-10.mp4)

## Den Watch 2011 Instructions:

[http://www.bear.org/website/images/stories/education-outreach/resources/DenWatch2011\\_Instructions.pdf](http://www.bear.org/website/images/stories/education-outreach/resources/DenWatch2011_Instructions.pdf)

## Goal:

The student will use observation skills and process skills to document bear behavior.

## Curriculum Focus:

Science, Written Language, and Technology

## Lesson:

**Background:** Wildlife Research Institute Biologists Dr. Lynn Rogers and Sue Mansfield have used remote cameras to observe black bear denning behavior near Ely, Minnesota. The cameras, or den cams, provide researchers first hand information so they can identify patterns and draw conclusions about black bear behavior while in hibernation, during and after birth, and up till emergence in the spring. Observers record or 'code' behaviors. The 'Den Watch 2011 Instructions' is included as a resource above as a reference for teachers. It explains the basic data collection instructions the volunteer den-observers used to record bear activity and vocalizations.

**Setting a Purpose; Introductory Activities:** Begin by introducing the importance of good observation skills when observing and describing animal behavior. Good observation skills enable researchers to accurately record individual animal behaviors. Ask students to describe the main types of behavior for a common animal such as a cat. Descriptive statements are recorded on chart paper, overhead, or interactive whiteboard, and then classified into categories, and assigned a code. Examples of descriptive statements and categories might be:

Lying down with eyes open:	resting-R
Lying down with eyes closed:	sleep-S
Licking the body or paws:	grooming-G
Meowing and rubbing against a human's legs:	begging-B
Purring, meowing:	communicating-C

Have several students pretend to be the animal described and ask the class to code their behavior for a short duration. Compare recorders' results. Remind students their job is to record behavior as accurately as they can, and to avoid descriptions such as happy, or angry.

**Modification for Younger Children:** If this is difficult for younger children, gather a bunch of stuffed animals and place them in a shopping bag. Model the following procedure for the children, and then allow them to have a turn. One at a time have children choose an animal in the bag, but do not show the other children the animal. The child must give clues about the animal by describing its attributes: color, what it eats, where it lives, how big it is, etc. Learning to tell another person the details about an object helps young children develop their observation skills.

**Activating Background Knowledge and Guided Practice:** Explain that observers try to make their observations as detailed as possible. Choose one or more, over successive days, of the embedded videos in the ABC's of Black Bears PowerPoint (available with Black Bear Box loan), or from Bear Videos on the North American Bear Center website (link above). Ask students to observe the bear(s) and pretending they are giving

a play-by-play of the action to a blind person. For example, after viewing a portion of the Eating Ant Pupae video, model the following description, “The black bear and cubs eat ants.” Explain that that description tells the main points, but misses a lot of detail. “Mother bear uses paws to break up log, two cubs join adult, cubs lick and scratch at log, third cub joins, adult leaves cubs and walks away, bird sings song, adult claws and bites at stump, mosquito buzzes” gives a more complete picture.

Older students can do quick writes of behaviors observed. Drawing or oral descriptions might be helpful for younger children in recording the setting, the bear’s movement, or what a particular behavior looks like. Be sure students understand they are not trying to analyze the behavior at this point, just give a full description of what the bear(s) are doing.

Utilize additional video clips from the above sources for modeling the difference between observations (what you know and can verify) and inferences (what you think you know or have concluded). Encourage children to ask themselves, “What’s going on here?” Choose partners and compare descriptions.

After observations are completed, notes or oral descriptions will be used to create a narrative description and list of behaviors the animal did. The goal is to be specific enough to provide enough detail including time of day, if known, weather conditions, and anything else that might affect the animal’s behavior, so someone who reads the description can recognize the behaviors if they see them.

The teacher will continue to build this experience through role-play scenarios utilizing archived den cam footage (link above).

**Independent Practice:** Students can help in the research by becoming bear scientists. They can make observations and collect data to learn about bear behavior. As scientists they have to be patient and watch their subjects, in this case bears. By studying behaviors they will be able to tell many things about the animal, but it takes careful observation to gather facts. After gathering facts they might find patterns immerge during certain times of day or certain temperatures. Alone these facts may not stand out, but when seen in a scientific notebook and studied as a group, patterns emerge.

Provide students with a simplified, age appropriate, set of activity and vocalization codes (see page 5 of the ‘DenWatch 2011 Instructions’ for ideas) version of the Data observation sheets used by the volunteer den recorders. Set a purpose or focus for the observations (behavior, vocalizations, etc.) depending on the level of the student.

In the primary grades, observations could be recorded using one word (sleeping) or a sentence to stress the writing component (The bears are sleeping.) The code level of den watch observations should build as you go through the grade levels depending on skill. The codes should be simplified for elementary grades (sleeping, playing, nursing, crying, etc.).

A class log can be filled in daily by the teacher or by the students to summarize data and graph results.

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# Bear Log Sheet



Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Observation: (Movement, Sounds, Breaths, Weather Conditions, etc...)

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# Bear Log Sheet



Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Observation: (Movement, Sounds, Breaths, Weather Conditions, etc...)

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