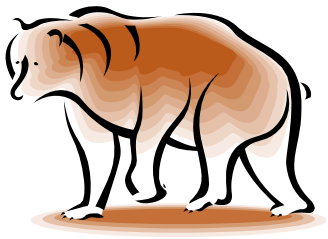

Bears of Glacier Bay National Park

Middle School Scientists Curriculum

Investigation 1: Name That Bear

Overview:
Students begin this investigation by watching the nine minute video, *Bears of Glacier Bay*. Tania Lewis, a researcher at Glacier Bay, interacts with local students to answer questions about the two bear species found in Glacier Bay. Students discuss their reactions to the video and then become researchers in a role play activity. As researchers, the students collect data to compare similarities and differences between people and bears at various stages of **maturity**. Students will illustrate and graph these differences.

Class Time Required	1 class period (50 minutes)
Materials Needed: • Student journals • Internet access • Video and Vocabulary Sheet (1 per student) • Bear Photo Gallery Sheet (1 per student) and Key • Bear Biology Handout (1 per student) • Measuring Up Chart (1 per student) and Key • Scale, tape measure or yardstick	
Teacher Preparation:	30 minutes to read background information, investigation, and preview video.
Student Knowledge:	Basic understanding of bear biology, outdoor recreation in bear country
Vocabulary:	omnivore, maturity, torpor
National Content Standards • NS.5-8.1 Science as Inquiry • NS.5-8.3 Life Science	

Background Information:
Glacier Bay National Park is home to brown/grizzly bears (*Ursus arctos*) and black bears (*Ursus americanus*). Black bears are found primarily in the forested regions of the lower bay, while brown bears live mainly in the open, recently deglaciated regions of the upper bay.

Brown bears and black bears are closely related, but have many different traits that help distinguish the two species. Brown bears are usually larger than black bears and have a prominent shoulder hump, subdued ears, and longer, straighter claws. Their long claws are useful in digging roots, but not effective to climb trees. Black bears lack a shoulder hump, have prominent ears, and short, curved claws. They live in forested areas where climbing trees is their best method of defense. A large male brown bear may weigh up to 1400 pounds compared to 300 pounds for a large male black bear. Both have an exceptionally acute sense of smell, while their eyesight is similar to that of humans. One of the most distinguishable features of both species is their face profile. Black bears have a straight face profile and brown bears have a more dish shaped profile.

Color is not a reliable key in differentiating these bears because black and brown bears have many color phases. Black bears can range in color from jet black and cinnamon to white, while brown bear colors range from dark brown to very light blond.

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Both brown bears and black bears spend the winter months in a state of hibernation called **torpor**. They enter this dormancy period in late fall when food availability drops. In the spring, bears emerge to feed on the abundance of food available.

Through careful observation and scientific research, park biologists gain an understanding of how bears interact with their environment, each other, and humans. This knowledge allows them to make the best management decisions to protect bears, humans, and the habitat.

Focus Questions:
What are the differences between brown bears and black bears?
How does bear growth, development, and maturation compare to humans?

Engagement:
(15 minutes)
Pass out the Video and Vocabulary Sheet to each student and give them a few minutes to answer the questions prior to watching the video. Show students the video *Bears in Glacier Bay*. The video highlights current research in Glacier Bay National Park as researcher Tania Lewis interacts with local middle school students. The interaction is question and answer format, allowing time to stop and start the video to solicit answers from students. As they are watching, the students should write down the researcher's answers to the questions. In conclusion, review what the students already knew about bears, what they learned about bears and how scientists study bears.

Investigation:
(30 minutes)

1. Begin a discussion with the students about the differences between brown bears and black bears. Have the students look at the Bear Photo Gallery Sheet. Have students identify each bear as either a brown bear or black bear. Ask students to think how different physical traits help each species survive.

2. Ask students what they think bears weigh, how tall they are when walking and standing, how long sows are pregnant, how many cubs might be born at the same time, and how long they live. Write some of their answers on the board.

3. Following the discussion, hand out the Bear Biology Handout and Measuring Up Chart. Have students read the comparative information in the Bear Biology Handout to help them complete the chart. Students will weigh themselves and measure their height to obtain accurate data. They may have to estimate their weight at birth, and at one year of age, if not known. Obtaining this information could also be assigned as homework prior to the investigation.

4. Discuss the student's results and ask them to comment on the similarities and differences between bears and people.

5. Using a yard stick, have a student mark out the sizes of bears standing up compared to a human. You can start by tracing a student against the chalkboard or wall and then putting a piece of tape above or below to reflect the sizes of the two bears standing up. Are they surprised? If space and time allows, have the students work in pairs and do this on the sidewalk or asphalt with chalk.

6. Use the data in the chart to construct a graph that compares the growth of brown bears, black bears, and humans. Begin with the weight at birth, weight at one year, and weight as an adult. Have students record the results in their journals.

Explanation:
(10 minutes)
After students are finished graphing their data, ask them to make a hypothesis about "Why do bears and humans mature at different rates?" Allow them to talk with a partner for five minutes to help develop their thought processes and understanding of the scientific method. After the five minute exchange, have students share their thoughts with the class and each write their hypothesis in their science journal.

Extension:
Is it a black bear, brown bear? The two species can easily be confused. Use the "Brown vs. Black" video clip (http://www.nps.gov/glba/naturescience/bear-identification.htm) located on the park website to highlight several identifiable characteristics to help students decide. For fun, have students take the "Bear Identification Quiz" at the end of the program to see if they are on their way to becoming a bear researcher!

References/Resources:

Official Glacier Bay National Park Website
http://www.nps.gov/glba/naturescience/bears-at-glacier-bay.htm

Alaska Department of Fish and Game - Wildlife Notebook Series
http://www.adfg.alaska.gov/index.cfm?adfg=educators.notebookseries - 150 Alaska wildlife species

International Association for Bear Research and Management
www.bearbiology.com

Free environmental education lessons and downloads from WildBC.
http://www.wildbc.org/publications-resources/grizzly/student.pdf

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NS.5-8.1 Science as Inquiry

Abilities Necessary to do Scientific Inquiry (5-8):

- Identify questions that can be answered through scientific investigations. Students should develop the ability to refine and refocus broad and ill-defined questions.
- Use appropriate tools and techniques to gather, analyze, and interpret data.
- Develop descriptions, explanations, predictions, and models using evidence.
- Use mathematics in all aspects of scientific inquiry.

NS.5-8.3 Life Science

Regulation and Behavior (5-8):

- All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.