

## LESSON 6 Student Sheet A



### Polar Bears and People



A female polar bear calmly nurses her cubs on a cold fall day as cameras click and visitors quietly talk. Farther down the coast, two strong male bears are so busy wrestling they do not notice a tourist vehicle.

Every fall season thousands of people come to Churchill to watch



the polar bears on the shores of Hudson Bay. The visitors leave with an appreciation of polar bears and their ability to survive in the Arctic. **What effect, if any, do the tourists have on the bears?**

**To answer these questions, PBI funded a two-year study. Scientists measured the bears' responses to vehicles and sounds and how those responses might change over time.**

### Facts Were Needed

PBI's President, Robert Buchanan, has said that no one wants to hurt the bears and that the people who run the bear-watching companies are very careful not to hurt the bears. Thanks to this study, we now have information that will help the companies set guidelines.

Dr. Jane Waterman and Dr. Jim Roth of the University of Central Florida did the study for PBI to find out how much humans affected polar bears. They worked with a student named Gillian Eckhardt. They got help from the Tundra Buggy Adventure® (TBA) and Hudson Bay Helicopters. In addition, Nikon Corporation provided high quality digital cameras and lenses to help the team identify individual bears through their whisker patterns.

"The teamwork was incredible," says Buchanan. "Everyone worked together for the good of the bears. What's more, now that the facts are in, local companies have been more than willing to adjust their own procedures to make sure that their activities don't disturb the bears."



**Just like no one has the same fingerprints as you do, every bear has a one of a kind whisker pattern. Scientists use the whisker pattern to tell bears apart.**



**The first approach was to go directly toward the bears.**



**The second approach was indirectly.**



**The last approach was indirectly with sound.**

## Reaction to Vehicles

A major part of the study was to measure the bears' reactions to tundra vehicles. The research team created "approach experiments" to find out at what distance, if any, polar bears are disturbed by the vehicles. The scientists tested three different ways to approach the bears to measure their reactions.

Over two years, the scientists recorded 186 approaches (68 in 2003 and 118 in 2004). In each approach, a driver drove a tundra vehicle toward a stationary bear—that is, one lying, sitting or standing—at the same speed while a volunteer taped the bear's behavior with a digital camcorder. The researchers stopped each approach if the bear responded or if they came within 17 meters. They defined a response as "any sudden movement or change in whole body position or behavior at the time of approach."



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## Sound Experiments

The scientists also studied the effect of human-created noise on a polar bear's behavior. In 2003, they measured the average noise levels produced by visitors on tourist vehicles. They then used this noise level to study its effect on the bears.

"In this experiment, we would approach a bear indirectly in a tundra vehicle until we were next to it," says Waterman. "Once the vehicle had stopped, we would turn off the engine and roll down a window on the side facing the bear. Then we used speakers to play a random selection of one of four recordings, each eight seconds in length. One was a control recording and three had human voices."

The team ran the same experiment with the same bears for days in a row to find out whether the bears would get used to human-created noises.



## Study Results

The scientists found that 70% of the bears did not respond at all. The 30% that did respond did so when a vehicle came closer than 42 meters.



*If they approached 10 bears, the seven bears outlined in green represent the bears that did NOT respond. The purple outlined bears represent the bears that did, but only if the scientist came closer than 42 meters, which is about the length of 5 minivans put together.*

The speed of the vehicle and approach angle also affected the likelihood of a response. An indirect approach was the least threatening. Based on this data, the scientists concluded that **drivers can decrease the responses by controlling how close they get to the bear, the direction from which they approach the bear and the vehicle speed.**

The scientists also identified two behaviors that predicted a response to an approach: lip smacking and body shift. In their report, they recommend that drivers watch for these cues to minimize responses by the bears.

In the sound experiment, only a very small percentage of the bears responded to the playback trials; none of the bears responded to the control trials.

The team concluded that the bears appeared to quickly get used to tourist vehicles and human-made sounds. Indeed, five male bears observed in 2003 did not respond at all to tourist vehicles in 2004.

## Churchill Loves Its Bears

The full support of the Churchill community made the project possible. PBI would especially like to thank the Tundra Buggy Adventure<sup>®</sup>, which has played a leadership role in the town's ecotourism industry. In recognition of its contributions, TBA received Travel Manitoba's 2005 Ecotourism Award and recently added an environmental scientist to its staff to make sure that its tours remain bear- and tundra-friendly.

PBI would also like to thank the professional tundra vehicle drivers. "They were already acutely aware of the boundaries needed to keep from disturbing the bears," says PBI, "and they were enthusiastic about the results of the study because it confirmed what they had already observed."