

*An Arctic Adventure:*  
 TO THE TOP OF THE WORLD  
 WITH THE  
**BEARS OF THE SEA**



PRESENTED BY POLAR BEARS INTERNATIONAL



*An Arctic Adventure: To the Top of the World with the Bears of the Sea*

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*In the Arctic winter temperatures can plunge to -50°F and stay that way for days or even weeks. The summer lasts from mid-July to late September with peak temperatures of 90°F. How do polar bears survive in this place?*

R. & C. BUCHANAN

*An adult male polar bear is huge, weighing 500 to 1,100 pounds. Some males can top 1,500 pounds! A mature male is so big—8 to 11 feet long—that he couldn't fit through your front door. Female polar bears are considerably smaller than males, averaging 330 to 550 pounds. They can grow up to 6-8 feet.*

COVER PHOTOS:  
CANADIAN MUSEUM OF CIVILIZATION: S96-1626  
R. & C. BUCHANAN  
KENNAN WARD



PHOTO COURTESY OF: R. P. BECK

# Discover the fascinating, frozen world of Polar Bears!

## Activity:

The word “Arctic” comes from the ancient Greek Arktikos, or “country of the great bear,” named after the constellation Ursus Major, the Great Bear, found in the Northern Sky. Go outside and look for the constellation. Start by looking for the constellation we call “The Big Dipper.” Ursus Major has additional stars included.

## Getting to Know the Sea Bear

by Downs Matthews

*No animal better symbolizes the arctic regions than Ursus maritimus, the sea bear. A survivor in one of the world's most hostile environments, the great white hunter of the frozen North deserves both respect as a biological marvel and admiration as a beautiful example of Nature's art.*

*Among the northern people of old, the polar bear enjoyed legendary status. The Inuit regarded him as the hunter's greatest trophy. Laplanders thought of him as the old man in the fur cloak. Norse poets called him the white sea deer, possessed of “twelve men's strength and eleven men's wit.” He was the whale's bane, the rider of icebergs, the sailor of the floe. Happily, the sea bear is still all of those things, and more. With public support and science-based knowledge, we can keep it that way.*

*Polar Bears International has produced this guide to show you polar bears and their world. We welcome your help in assuring a safe future for the old man in the fur cloak.*

*Downs Matthews is a member of the board of directors of Polar Bears International. A veteran observer of arctic wildlife, Matthews is the author of Polar Bear Cubs, 1989, Simon and Schuster; Arctic Summer, 1993, Simon and Schuster; and Polar Bear, 1993, Chronicle Books.*





# Just the Bear Facts



R. P. BECK

## Keeping Warm or Keeping Cool?!

Polar bears have two layers of fur covering their entire body, even the bottom of their paws. What color is a polar bear? We see their fur as white, but each hair is actually a clear, hollow tube that reflects light. Their fur, combined with a thick layer of insulating fat (up to 4.5 inches thick) keeps their body temperature at about 98.6°F (the same as us!) even at 34°F below zero! Arctic summers can be warm, hot if you have a heavy fur coat. How do polar bears keep cool?

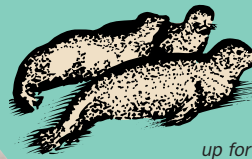
## Great Bears of the Sea

Watch polar bears swim and you can see they love water. Skilled divers and swimmers, they see very well underwater to chase seals. Polar bears have huge feet with webbed front paws. Polar bears can swim more than 60 miles without a rest. Their fat layer not only insulates them from the icy cold water but makes them more buoyant. When a polar bear gets out of the water, it shakes like a dog or sometimes drags or pushes itself across the ice to wring water from its fur. No wonder they're called Sea Bears!

## What do Polar Bears Eat? Anything They Want

A polar bear's nose is constantly wiggling. With their excellent sense of smell they find prey by sniffing out seal dens and breathing holes from far away. Polar bears are the world's largest land carnivores. Their main food is ringed seals but they also eat hooded and harp seals, beluga whales, and sometimes, young walrus. When food is plentiful, polar bears eat only the seal's calorie-rich blubber and skin. Younger, less experienced bears eat what's left.

2



Seals are marine mammals and must come up for air. They cut air holes in the thick ice and poke their heads up for a breath.

In winter polar bears wait patiently for hours for the seals to come up for air. When they do, the polar bear quickly pulls them from the water.



DAN GURAVICH

There is so much more that is cool about polar bears! Go to the Polar Bears International website: [www.polarbearsinternational.org](http://www.polarbearsinternational.org). See other resources on page 11.

R &amp; C BUCHANAN



**LEGEND:**

- high polar bear population
- low polar bear population
- few bears

*Circumpolar Arctic — This imaginary line on the globe surrounds the North Pole. Polar bears live on the edges of the land that touch the sea. Each season the bears are found throughout the area — always hunting.*

**Where the Wild Bears Are**

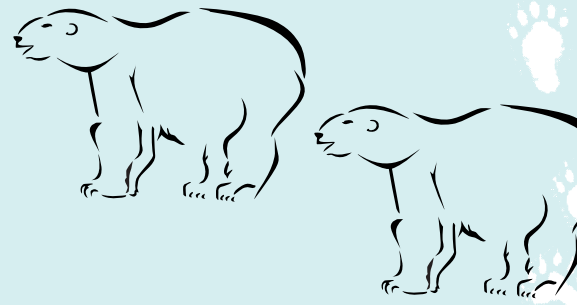
Worldwide, there are approximately 22,000-27,000 wild polar bears that live in the circumpolar Arctic, which includes the United States (Alaska), Canada, Russia, Greenland, and Norway. Do penguins live in the same area as polar bears? No! Polar bears live only in the circumpolar Arctic. Penguins live only in the southern hemisphere. Polar bears are incredible walkers, averaging 5,500 miles a year! The fur on the bottom of their paws helps provide traction on slick ice.



R & C BUCHANAN

**Talk To Me**

Polar bears communicate with each other by sound and moving their bodies. A low growl warns other bears, “don’t bug me.” When food is abundant, polar bears will even share part of the kill with each other. A bear will beg from another bear by coming up slowly, circling around the carcass, and then meekly offering a nose-to-nose greeting. When a polar bear wants to play, he will wag his head from side to side or stand on his hind legs with his chin lowered to his chest and front paws hanging by his side. When really angry, polar bears hiss and snort with their heads down. An attacking polar bear charges forward with head down and ears laid back.



**Mama Bear and Her Cubs**

Female polar bears usually have two cubs. Though mating takes place in April or May, the fertile eggs (ova) do not start to grow until fall — a process called delayed implantation. The cubs are born in winter and emerge from the den in spring when there is abundant food. The female must store enough fat to nurse her cubs and maintain her health while in the den and not eating for nearly 6 months. When born, the cubs have fine, silky hair, are blind, and about the size of a squirrel. A mother bear tries to avoid adult male bears because they sometimes attack and eat cubs. But if threatened, her maternal instincts are so strong that she can often fight off a much bigger attacker. In the Low Arctic polar bear cubs drink their mother’s milk for at least 20 months and depend on her for everything for their survival. In the High Arctic, where conditions are more harsh, cubs nurse through their third birthday.



R. & C. BUCHANAN

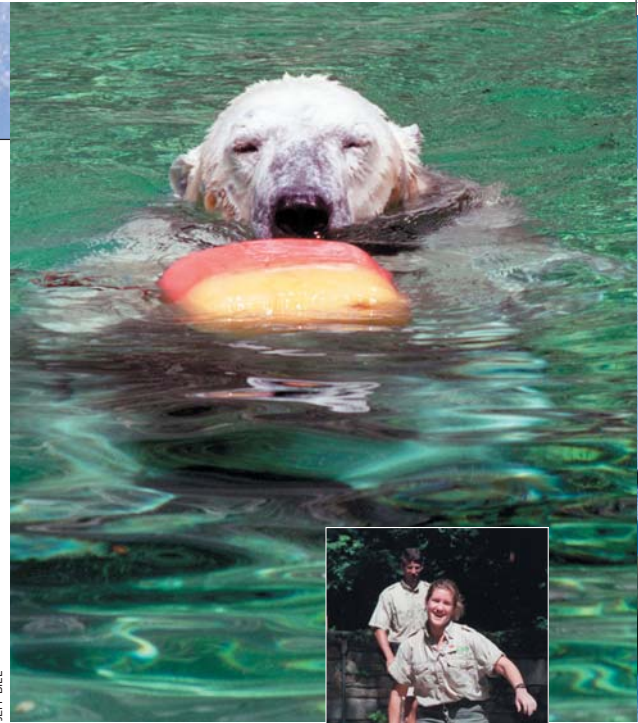


An Arctic Adventure: To the Top of the World with the Bears of the Sea

# Why, How, and Where Scientists Study Polar Bears

## Understanding Bears

Scientists use a variety of strategies to gather information that creates understanding of the complex lives of bears. Research is conducted both in the wild and in zoological parks. Each place offers different benefits and limitations. The Arctic is a very difficult place for humans to conduct research. Research about wild bear populations helps scientists understand more about the Arctic and helps zoo keepers provide safe and healthy spaces for bears to live in conservation programs at zoos. Research about bears in zoos helps field researchers learn more about how the bears' bodies function and social behaviors between bears.



JEFF BILL



JEFF BILL

*"Magnet, our polar bear, was born at the Toledo Zoo. The best thing about taking care of him is he is so active. We give him fish frozen in water or Gatorade® as enrichment."* — Amy, Baltimore Zoo Keeper

## Activity:

**Observing and recording an animal's behavior is a research strategy. On your next visit to a zoo try this activity:**

Make a chart (an ethogram) like the one below with the list of behaviors on one side and time on the other. Make a check mark of the behavior observed each minute. Here is a list of behaviors to watch for: Playing/Enrichment, Eating/Drinking, Sleeping, Walking, Resting, Bathing/Grooming, Social Interactions, Exploring/Swimming, Digging, Climbing, Sniffing the air.

TIME IN MINUTES	1	2	3	4	5	6	7
PLAYING							
EATING							
SLEEPING							
WALKING							
RESTING							
GROOMING							
DRINKING							
DIGGING							
SWIMMING							



KENNAN WARD

When the adult female bear is tranquilized the cubs stay close. The scientists catch them and give them a little tranquilizer to weigh and tag them and do a general health check. The family is left to wake up together.



KENNAN WARD

Scientists cannot follow polar bears over the great distance they travel. Radio collars like this are attached to bears. Signals are sent to a satellite and back to the scientists.

# Activity:

**How do you pack for field research to the Arctic to study bears?**  
 Read through the list below. Mark which materials you would pack. Then check the real packing list on page 13 from Cam Elliot, Wildlife Manager, Manitoba Conservation, when he goes to the Arctic to do research for 2-3 weeks at a time.

- Water
- Fuel
- Tent – small nylon with a floor
- Tent – large 10'x12' canvas with no floor
- Sleeping bag
- Thick foam with canvas tarp
- Caribou skins
- Shovel
- Hand saw
- Satellite phone
- Flashlight
- Axe
- Firearm
- Ice chisel
- Fishing net
- Basic first aid kit
- Toiletry kit
- Canned goods
- Matches
- Tea
- Sugar
- Meat (dried and frozen)
- Klim (dried milk)
- Flour, baking powder to make bannock (bread)
- Pots and pans
- Lantern
- Cook stove
- Dried soup



KENNAN WARD

## Churchill, Manitoba: Polar Bear Central



R. & C. BUCHANAN

Polar bears stay on the ice as long as possible to hunt. Eventually, the arctic summer thaws the sea ice near Churchill in July and the Hudson Bay polar bears come on land until the ice forms again in November. Humans — scientists, eco-tourists, professional photographers, and polar bear enthusiasts — seasonally gather in Churchill because of the bears.

### Living with Polar Bears: Polar Bear Alert!

Human activity can produce trash dumps and vehicle traffic that causes problems for wildlife, especially bears. At first “problem bears” were flown a long distance away... only to have them return. The Polar Bear Alert! Program created by Manitoba Conservation is based upon normal bear behavior and needs. This program educates the public about their role in creating bad bear behavior and prevents polar bears from developing problem behaviors. With the changes in the trash dumps and other human behavior the number of problem bears in Churchill has decreased. What will happen if the climate changes?



Churchill has a long history serving as a native village, a northern base for scientific research and military operations, and shipping port. Today, Churchill survives largely on tourism. In winter the population is around 600 and in summer, around 1,200.



V. H. BECK



Springs



RANDY GREEN

Summer

**The POLAR BEAR**  
A fun board game for the entire family (recommended ages 6 and up)

Follow the Churchill polar bears as they cross the pack ice of Hudson Bay in search of food while braving frigid temperatures, blizzards, and other obstacles. The object of this game is to discover the amazing physical and behavioral strategies polar bears use to survive.

**Churchill**

Female loses caught seal to a large male. Lose 3 pounds.

Subadult male or female loses caught seal to a large female. Lose 2 pounds.

Seals think you are a piece of ice while swimming and you capture one. Gain 16 pounds.

Another bear allows you to share their walrus kill. Roll the die and gain 10 times the number.

Ice begins to thaw and you manage to stay in the north on the ice. Roll the die and gain 10 times the number.

You catch a seal, but it's old and not very fat. Gain 4 pounds.

Ice becomes thin, fewer seals so you swim further between ice floes. Lose 4 pounds.

Find a cool den dug deep into the earth where there is permafrost and it keeps you cool. You don't lose any weight.

Eat some kelp (sea weed). Lose 2 pounds.

Really hot day and nowhere to cool down. Lose 4 pounds.

Subadult (female or male) gets hungry and goes to the Churchill dump. Go to Bear Jail and skip next turn.

If you are a subadult male play fight with another. Lose 4 pounds.

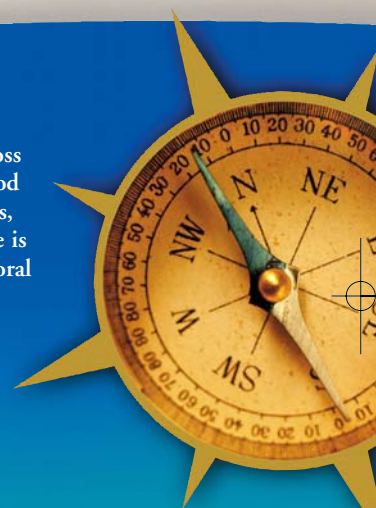
Adult female comes out of her den and kills a seal. Gain 25 pounds.

Spring is in the air. You feast on seal. Roll the die and gain 10 times the number.

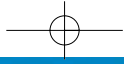
You find a seal in its snow lair with its baby. Gain 12 pounds.

A big blizzard blows as you sleep along the ridge; the snow keeps you warm. No weight loss.

From ice floe for seals without a seal. Gain 5 pounds.







# Winter



R. & C. BUCHANAN

# BEAR TREK

family (recommended ages: 5 years and older).



We use an artificial number to show weight gain and loss, but the situations are based upon scientific research. For more information on how to play and to trace your own game piece, see inside back cover.

## Hudson Bay



V. H. BECK



# Fall

**FINISH**  
Tourists come on a Tundra Buggy®, you have your picture taken, and they all become supporters of polar bear conservation efforts.

**START**  
Hudson Bay begins to freeze. Go seal hunting. Gain 20 pounds.

Ice isn't solid, and you fall through. Back to start.

Adult female goes to her den to give birth. Skip a turn.

Ice freezes early and seal hunting is good. Roll the die and gain 10 times the number.

A large male bear is in the area. Retreat back to start. (All but other adult males).

You find a half-eaten seal and eat the blubber. Gain 12 pounds.

You find a seal's breathing hole and catch a seal. Gain 18 pounds.

If you are an adult male, a hunter chases you. Lose 5 pounds.

You find a seal's breathing hole. Wait for the seal to come for air. It never surfaces. Skip your next turn.

A beluga whale washes up on shore and you share the feast with other bears. Gain 25 pounds.

Sneak up on a walrus and capture the young. Gain 14 pounds.

Walk 50 miles in one day looking for a seal's breathing hole. Lose 8 pounds.

Stalk a walrus, but it sees you and slides into the water before you can catch it. Lose 3 pounds.

You swim from ice floe to ice floe for 30 miles without catching a seal. Lose 6 pounds.



R. & C. BUCHANAN



*Female bears lose half of their weight during denning. The combination of not eating and nursing their young is stressful.*

## Great Arctic Symbol

Polar bears are symbols of the wild Arctic. They have a difficult life. Not only do they face the harsh conditions in the Far North — bitter cold and threat of starvation — but today, they face problems from the modern world. Reducing these threats and learning about polar bears and their environment are the first steps toward protecting these wonderful creatures.

## Too Hot!

You may have heard of global warming or climate change before. There are many questions yet to be answered. Scientists have observed that the Western Hudson Bay now melts two weeks earlier than it did 20 years ago. The bears need ice to hunt seals, which means that the bears have less time to store up fat. This is a particularly serious problem for the females because they use so much energy to nurse their cubs. What can you do that will make a difference?

## Look but Don't Touch!

People love to see wild animals. How do you see a polar bear safely without disturbing the plants or animals? Eco-tourism helps protect polar bears and their habitats, provides opportunities for native people to earn a living, and provides bear enthusiasts, as well as scientists, with an opportunity to watch bears where they live.

# Let's Get to the Bear Issues

# What's In A Name?

The polar bear's scientific name, **Ursus maritimus**, means "sea bear" in Latin. • The Inuit people call the polar bear **Nanuk**, meaning worthy of great respect. In their poetry he is Pihqahiak, the ever-wandering one. • The Russian term for polar bear is **bely medved**, which means "white bear." • To the Norwegians, the polar bear is the **isbjørn**, or "ice bear." • In Denmark, the polar bear is also an ice bear, isbjørn. • Norse poets had several words to describe polar bears, including "the seal's dread," "rider of icebergs," "the whale's bane," and "the sailor of the floe." • The people of eastern Greenland call the great bear **Tornassuk**, "master of helping spirits." • The Ket tribe of Siberia call them **gyp** or **qoi**, which means "grandfather" and "stepfather," respectively.

## Hunter or Hunted

Hunting polar bears has played a role in native cultures for centuries. Traditional methods did not endanger the bears. Modern equipment, such as aircraft and snowmobiles, made hunting too easy and threatened to wipe out bear populations. Scientists lead the way to saving bears by sharing information. Based on this research, leaders from the five polar bear nations — Canada, Denmark (Greenland), Norway, Russia, and the United States — signed an historic agreement in 1973 agreeing to restrict hunting to native groups and to work together to conserve polar bears. These laws are dynamic and change periodically. Today, polar bear populations are considered "conservation dependent." This means that the number of polar bears are stable now, but could become endangered if not carefully managed.

## Pollutants

What pollution could there be in the Far North? What effect does it have on bears and other arctic animals? For example, oil spills cause the polar bear's fur to lose its insulating properties. Oil can contaminate food sources. Toxic chemicals from the South enter the Arctic. All of the world's air, rivers, and oceans, are connected. Researchers think these chemicals make it hard for the bears to fight disease and may make it hard for them to have babies. Scientists are looking for answers to these and many other questions; maybe you have some ideas.

## Keep it Clean, Man!

Power plants and car exhaust may contribute to climate change. What can you do that may make a difference? Use less electricity — turn out the lights when you leave a room. Drive less — ride your bike, walk, carpool or combine errands into one trip.

Toxic chemicals can flow into the bear's water, as well as ours. Reduce the use of household chemicals.

*Most male polar bears don't successfully mate until they are 8 to 10 years or older. Females breed about once every three years after they reach the age of 5.*

*How Old Will You Grow? Wild polar bears live from 15 to 18 years, a few bears into their early thirties. Captive bears live much longer, well into their thirties. One bear in a London zoo lived to be 41 years old!*



# Learn to Love the Great White Bears

10

*Those bears that grow into adults have learned how to survive the challenges of arctic life. Six out of 10 cubs die in their first year, falling victim to starvation, predation, and accidents. In contrast, only about five percent of adult bears die every year.*

Plan your adventure to see polar bears in the wild! See [www.polarbearsinternational.org](http://www.polarbearsinternational.org) for adventure tour companies that will take you into the frozen world of the Ice Bear!

One of the best ways you can help the world's polar bears is to learn as much as you can about them. Not only are they fascinating creatures, but you'll learn about other issues like habitat conservation and biodiversity. Join one of the many organizations dedicated to conserving polar bears and their arctic habitat. And after you become a polar bear "expert," let other people know how wonderful bears are and why we must protect them.



CANADIAN MUSEUM OF CIVILIZATION: S96-1626

## Explore More!

### Paper & Ink

Check out these books on polar bears filled with great photos, facts and stories:

*A Polar Bear Biologist at Work* by Dorothy Hinshaw Patent (Grolier Publishing: 2001)

*Arctic & Antarctic* by Barbara Taylor (Alfred A. Knopf: 1995)

*Bears* by Ian Stirling & Aubrey Lang (Sierra Club Books: 1992)

*Bear: A Celebration of Power and Beauty* by Rebecca L. Grambo and Daniel Cox (Sierra Club Books: 2000)

*Journeys with the Ice Bear* by Kennan Ward (North Word Press, Inc.: 1996)

*Polar Bear* by Dan Guravich & Downs Matthews (Chronicle Books: 1993)

*Polar Bears* by Ian Stirling & Dan Guravich (University of Michigan Press: 1998)

*Polar Bears: Living with the White Bear* by Nikita Ovsyanikov (Voyager Press: 1996)

*Nanook and Naoya: The Polar Bear Cubs* by Angele Delaunois & Fred Bruemmer (Orca Book Publishers: 1995)

*Nanuk: Lord of the Ice* by Brian J. Heinz & Gregory Manchess (Dial Books for Young Readers: 1998)

### No Ink

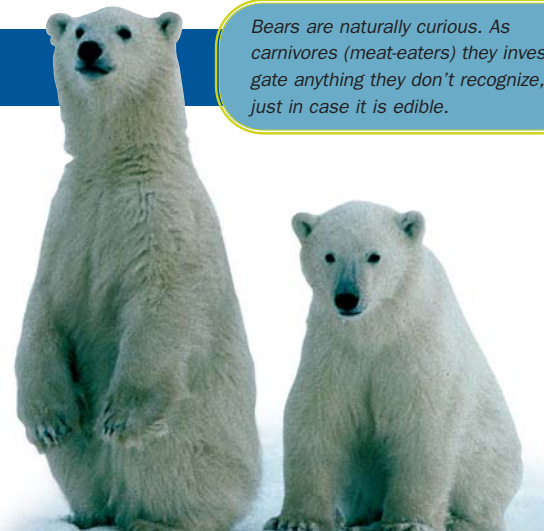
In addition to the Polar Bears International website we found these...

- Meet Professor Polar Bear! This site is developed for teachers and students by The Atmospheric Radiation Measurement (ARM), part of the U.S. Department of Energy's strategy to understand global climate change.  
<http://www.arm.gov/docs/education/>
- An animal information database developed by the University of Michigan Museum of Zoology provides great basic information.  
<http://animaldiversity.ummz.edu/>
- Parks Canada adds an interesting perspective—safety with polar bears.  
[http://parkscanada.pch.gc.ca/Library/NationalParks/Polar/English/polar\\_e.htm](http://parkscanada.pch.gc.ca/Library/NationalParks/Polar/English/polar_e.htm)
- The Bear Den - All About Bears. Descriptions of the eight bear species, including polar bears, provided by the American Zoo and Aquarium Association's Bear Taxon Advisory Group.  
<http://www.bearden.org>
- News organizations provide a variety of perspectives. Take a look at how climate change and the shrinking arctic ice cap has affected the chances for survival of polar bears near Churchill, Manitoba.  
<http://www.tv.cbc.ca/national/pgminfo/warming/>

## Just Wild About Polar Bears

### A Kid's View

*Even though I live in California, a climate far too warm for polar bears, they have always been a big part of my life. My mom rewarded "my obsession" with a trip to Churchill (to see the bears). We wanted to be around the bears 24 hours a day! I kept a science journal, in which I collected data for a science fair project. My mom and I had fun and met so many cool people. I learned and understand much more about polar bears. This experience affected me in a way I couldn't have dreamed of and helped me develop a new respect and love for the polar bear that I can't describe. Nika Kolodziej, 12 years old*



Bears are naturally curious. As carnivores (meat-eaters) they investigate anything they don't recognize, just in case it is edible.



## *Polar Bears International — Ambassadors of the Sea Bear*

Polar Bears International (formerly Polar Bears Alive) is an organization dedicated to the worldwide conservation of the polar bear through education. Serving as an international resource on polar bears, PBI promotes constructive dialogue and works to promote teamwork, education and public outreach on behalf of polar bear conservation.

### **Supporting Polar Bears 100%**

Polar Bears International strongly believes that all donations should directly help the bears. Therefore, all officers and directors serve without pay or expense reimbursement in order to ensure the lowest possible administrative costs. The online Polar Bear Store completely underwrites our administrative costs, so 100% of all donations are used to help polar bears.

### **Membership Information**

Please join us to help protect the great white bears worldwide. Become a member and you'll receive the quarterly newsletter, *Polar Bears International*, published by and for polar bear lovers all over the world. Go to our website today and find out how you can help support polar bears!



[www.polarbearsinternational.org](http://www.polarbearsinternational.org)

# THE POLAR BEAR TREK

**Play this fun boardgame on pages 6-7!**

This is just a game.

In real life, the Hudson Bay polar bears maintain their weight during the winter season until spring when the bears feast to gain extra weight for the summer time when they do not eat. Each day during the summer an average bear loses 2 pounds per day. The pressure to find food increases as the winter approaches. These polar bears gather near Churchill in anticipation of the ice forming and hunting anew.

## Number of Players: 2 - 6

### Materials Needed:

1. Paper and pencil to keep score. Each player can record how much weight they gain or assign a master scorekeeper.
2. One die (borrow from another board game).
3. Polar bear game piece. Make your own by tracing the bear on this sheet.

### How to Play:

- Roll the die to determine the sex and age of your bear. (Males could be odd numbers and females even numbers. Subadults (ages 1-5) could be odd numbers and adults could be even numbers.)
- Roll the die again—the highest number thrown goes first.
- To start, roll the die and move your bear forward the number of spaces. Follow the directions on the board.
- If your bear lands on the same square as another bear here are a few behaviors:
  - Subadults always yield to adults and move back one space.
  - If both bears are male and subadults OR both are adults they play fight. The highest roll is the winner and stays on that square. The other player moves back one space.
  - If one bear is male and the other is adult female, she will likely have cubs and will ferociously defend her young. Roll the die, the high number stays at the square, the low number retreats back one space.

## Surviving is Winning

How did your bear do? In order for the Hudson Bay bears to survive the summer they must gain about 300 pounds. For pregnant females to survive and nurse their cubs they must gain over 600 pounds before the ice breaks up. You may find that none of the bears in the game gained enough weight. Inexperience in hunting and surviving and consequently starving is not unusual. The arctic environment is harsh and unforgiving.



*Trace this polar bear on your own paper and cut out for your game piece!*

## Answers to Packing List Activity, pg. 7

Everything on the list except the following should be packed: Water, nylon tent, canned goods, and a flashlight. Here is why:

- Don't waste space packing water — it surrounds you in the Arctic. Snow and ice are melted for cooking and drinking. But not a shower!
- A nylon tent with a floor holds too much humidity from people and damp clothes. The canvas tent without a floor is better, but you better have packed the caribou skins to sleep on!
- The handsaw you packed isn't for cutting wood for fuel — there aren't any trees. Rather it is for carving snow blocks to make a wind break for the tent.
- Canned goods freeze and you know what happens if you put a can in the freezer — it can explode as the food expands in the confined space of the can.
- The lantern provides both heat and light. Unless you can keep a flashlight next to your body, it is too cold for the batteries to work.

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**PBI was founded in 1992 by wildlife photographer Dan Guravich, a Canadian native who was internationally known for his work with polar bears.**

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**POLAR BEARS INTERNATIONAL PROJECTS INCLUDE:**

- Funding research on how to improve the lives of polar bears in zoos.
- Developing an online library of information for use by scientists, educators, the public and the media.
- Underwriting polar bear research on Russia's Wrangel Island, home to more polar bear denning sites than anywhere else in the world.
- Public outreach through the "Polar Bears International" newsletter and website.

*Conservation through Education*



DAN GURAVICH