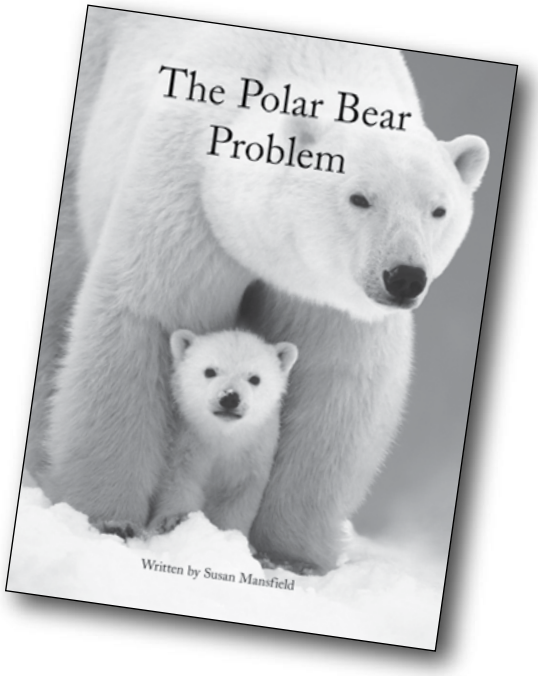
Springboard 6



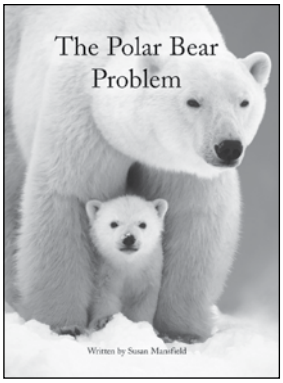
The Polar Bear Problem

Fact

Text Type	2400–3000 words	3100–3500 words	3500+ words
Discussion	Do You Like Fast Food?	Do You Like Watching TV?	Would You Travel in Space?
Exposition (Proposition/ Support)	Cars! Cars! Cars!	Litter at the Top of the World	The Polar Bear Problem
Information Report (Cause/Effect)	Bushfires!	The Piece of Paper Path	A Sneeze Is Coming On
Survival Story	Trapped in the Tube	Against All Odds	I Survived a Shark Attack

MACMILLAN

We have designed these lesson plans so that you can have the plan in front of you as you teach, along with a copy of the book. Suggestions for teaching have been divided into questions and discussion that you may have with students before, during, and after they read. You may prefer to explore the meaning and the language in more detail before students read. Your decisions will depend on the gap between students' current knowledge and the content, vocabulary, and language of the book they are about to read. The more information students have up front, the easier it will be for them to read the text.



THE POLAR BEAR PROBLEM

Upper level fact
Text type: Exposition (Proposition/Support)
Reading age 12–12.5
Word count 3500+

Guide questions for teachers are in *italics*.

Before Reading

Discuss a variety of nonfiction text types. Support students to identify that factual information can be presented as a discussion, exposition, information report, or survival story. Explain to students that an exposition is an explanation of facts.

Examine some nonfiction titles and support students to identify the different text types.

Support students to identify that factual information can be presented as a discussion, exposition, information report, or survival story.

COVER

Before Reading

Read the title and examine the cover photograph. Discuss what the book may be about. *What could the problem be?* Prompt students to consider what they may have read, seen, or heard about global warming and Earth's ice caps.

Read the blurb and invite discussion. *What do you expect to find out as you read this book?*

Allow students a few minutes to browse the text and gather more information about this topic. Discuss what students find as they walk through the book.

CONTENTS PAGE

Open the book. Discuss the features of the contents page.

Students should mention the terms *glossary* and *index*. Ask students to explain what each term means. Visit each of these pages to clarify that the glossary provides meanings for new or tricky words about the topic, and the index provides the page numbers to help the reader locate particular things in the book.

Revisit the contents page. Discuss the term *introduction*. *What does this mean?* Lead students to acknowledge that an introduction will provide background information about the topic which will help them read the book.

INTRODUCTION

Before Reading

Read the title. Examine the photo and read the caption. Describe the climate at the Arctic. Why might this environment be the perfect habitat for polar bears? What makes polar bears well suited to these conditions?

Discuss the bold word and have students give their understanding of the word. Check the glossary meaning.

Read the introduction and find out more about the problem facing polar bears.

After Reading

Have students identify the problem facing polar bears.

What are the repercussions of the melting of the ice for polar bears?

What are the repercussions of the melting of the ice for humans? Invite inferences.

Discuss the term *extinct*. Have students identify other animal and plant species that are extinct. *What other words or phrases mean the same as* extinct*?*

KINGS OF THE ARCTIC

Before Reading

Discuss the title and what it means. Have students flick through the pages in this chapter to gather more information before reading. Discuss any new or unusual words, such as *Ursus maritimus* in the caption on page 8. Invite inferences and have students scan the top line of text on page 8 to search for more information.

Discuss the map on page 7 and the details on page 9.

Ask students to identify the glossary words. Ask students to explain the terms *populations* and *carnivores*. Visit the glossary and ask students to read the definitions aloud.

Instruct students to read this chapter. *As you read, jot down interesting points to discuss at the end.*

After Reading

Have students share the information they have found about polar bears.

Where are they found?

What is the estimated polar bear population and what is the life span?

What is a shelf of ice? Revisit page 8 to reread if needed.

Have students give a physical description of a polar bear.

What does the term carnivore *mean?*

Investigate other vocabulary, such as *herbivore* and *omnivore*.

CLEVER ADAPTATIONS

Before Reading

Read the title. Discuss the meaning of the title. *What is an adaptation?* Assist students to understand that to adapt is to change to better suit an environment or situation.

Invite predictions of which aspects of the Arctic environment might necessitate adaptation. Elicit such answers as extreme cold, slippery terrain, or problems of camouflage.

Ask students to flick through the pages and identify the glossary words. Invite students to explain the term *blubber*. Ask them to guess at the possible meaning of *papillae*. Visit the glossary and ask students to read the definitions aloud.

After Reading

Have students share the information they have learned about adaptation by polar bears to the Arctic environment.

What aspects of the Arctic environment do animals need to adapt to?

How are winters in the Arctic different to the winters that you are used to?

Why do polar bears need to move fast?

What are some ways in which polar bears cope with the cold temperatures of their environment?

How are polar bears adapted to living on an icy surface?

How are polar bears adapted to make them good swimmers?

GLOBAL WARMING, MELTING ICE

Before Reading

Read the title and have students share what they know about global warming and climate change. Invite them to look at the photos and captions. Walk through the photos in this chapter and discuss. During the walk through the book, direct students' attention to the bold words and discuss what they mean. Quickly navigate to the glossary to read the definitions.

Read this chapter. As you read, jot down some information about what you learn.

After Reading

Have students identify how climate change is affecting Earth. Prompt them to identify the causes of the problem and the impact it is having on animals. Support students to understand the worldwide impact of ice melting at the polar caps. Revisit the text to reread sections aloud if needed. *What can humans do about this?* Invite inferences.

Have students identify all the vocabulary associated with climate change. Make a list of these words or phrases.

WHAT POLAR BEARS EAT

Before Reading

Read the title and have students predict what polar bears might eat. Discuss the food chain on page 19, and have students note that polar bears sit at the top of the food chain. *What does this mean?* Discuss the remaining photos and captions.

Read this chapter and be ready to share what you learn.

After Reading

Have students clarify any new or unusual words, such as *ecosystem* and *lairs*.

Invite students to share what they have learned about the animals polar bears hunt, and the way polar bears hunt. *Do you know of any other animals that hunt in this way?*

What strategies do polar bears use when they hunt for food?

LESS ICE, LESS FOOD

Before Reading

Read the title and have students infer why less ice may result in less food. Invite students to look at the photo and caption on page 22. Direct students' attention to the bold word and ask them to make predictions about its meaning. Quickly navigate to the glossary to read the definition. Discuss why animals might hibernate. *Do you know of any other animals that hibernate?*

Read this chapter and be ready to share what you learn about polar bear behaviour as food becomes harder to find.

After Reading

Have students share the information they discover in this chapter. Prompt them to discuss the term *cannibalism*. Discuss the danger of polar bears eating human rubbish. Have students identify the types of human rubbish that might be harmful to polar bears.

If polar bears are strong swimmers, why do some drown while searching for food? Revisit page 23 to check if needed.

LESS FOOD, FEWER BABIES

Before Reading

Read the title and invite students to infer why less food may result in fewer babies. Look at the photo and caption on page 25. Discuss terms such as *maternity den*. Invite students to infer the meaning of this phrase. Check the glossary meaning. Walk through the remaining photos in the chapter. Discuss each briefly.

Read this chapter. As you read, jot down some information about how polar bears prepare their dens and raise their cubs.

How might less food make polar bears and their cubs vulnerable?

After Reading

Have students share what they have discovered. Discuss the maternity den and what it may look like. Compare the way polar bears raise their young to other animals that raise young in a similar way. *What other animals raise young in a den, burrow, or warren? Which other animals feed their young milk? What other infant animals remain with their mothers during infancy?* Discuss the terms *mammal*, *reptile*, *amphibian*, etc. Have students classify animals according to these groups.

What skills do mother polar bears teach their young?

FUTURE CLIMATE CHANGE

Before Reading

Read the title. Walk through the photos in this chapter and discuss each briefly.

Direct students to read this section and think of two questions scientists need answered, in order to save polar bears and other animals that live in this habitat.

After Reading

Have students share what they discovered in this chapter. Invite students to share the questions they think scientists need answered. Jot them down.

Have students infer what the world might be like if there was no ice in the Arctic region.

CAN POLAR BEARS BE SAVED?

Before Reading

Read the title and invite students to look at the diagram, photos, and captions. Walk through this chapter and discuss each briefly. Ask students if they have heard of the Kyoto Protocol. Explain that this is an international agreement that some countries have signed to work towards combating climate change. Tell students that they will learn more about the Kyoto Protocol as they read this chapter.

Direct students' attention to the bold term on page 36 and ask them to make predictions about its meaning. Quickly navigate to the glossary to read the definition.

Direct students to read this chapter and be ready to share their thoughts about climate change and the Kyoto Protocol.

After Reading

Invite students to share what they have learned from this chapter. Guide them to infer with questions. *What could happen if we don't do anything about changing our current habits?* Lead the discussion so that students evaluate how they think and feel about the Kyoto Protocol. *Do you think countries should sign this agreement? Why might some countries choose not to sign?*

ACT NOW!

Before Reading

Read the title. Ask students whether they think this issue needs immediate attention. *Why/why not?*

Have students read the last chapter. *As you read, think about the effect of not taking any action to reduce global warming. What will this mean for you? What can you do about it?*

After Reading

Invite students to share their ideas and opinions. Have students think of ways they can take some action on this issue. *Who could you contact? What would you say?*

Have students consider some daily behaviours that invite change. *What are some things you can do at home? How could we change or improve some of our classroom habits?*

CODE BREAKER

Tell students to open their books to page 11. Work through this chapter identifying all the words and phrases associated with this topic. List them on a board/chart. Invite students to think of other words that also match the chapter topic, such as *camouflaged*.

Have students work in pairs to choose two chapters of the book to revisit.

Have students revisit the text to find and record all the words and phrases associated with the chapter topics. Then have students think of other words that also match the chapter topics and record them underneath.

MEANING MAKER

Imagine that you are visiting the Arctic. Chat to a partner and discuss the following.

What you would expect the Arctic to look like, feel like, and sound like.

What you would take with you.

What you would hope to see and do when you arrived.

What your escape strategy would be if you came across a polar bear.

TEXT USER

The information in this book has been set out in a clear, easy-to-read manner. Revisit the text, showing students each page. What elements about this book help us to find information quickly? Guide students to notice that the subheadings clearly identify the start of new information.

How does this make it easy for us to locate the information we need? Engage the students in some practical examples.

Close your book. As quickly as you can, locate the information about global warming.

Close your book. As quickly as you can, find the information about maternity dens.

Discuss students' strategies for quickly navigating through the book.

What other features does this book have that help us? Assist students to notice the maps and diagrams.

TEXT CRITIC

Explain that all authors write books for a reason. *The purpose may be to entertain, to inform, or to persuade. Sometimes the purpose is clear, but at other times the purpose may not be clear. Some information books may be written in such a way that the author's feelings about the topic are communicated to the reader through the writing. This is called bias. Readers need to be aware of this possibility, and the possibility that they may be influenced by the author's opinions or feelings.*

Scan through this information book and find out whether this book gives only the facts, or whether the language shows the author is trying to shape your thinking about polar bears in some way.

View a documentary about global warming. *Does the documentary give just the facts, or does it include someone's opinion?* Discuss.

USING MULTIPLE INTELLIGENCES

Small group/whole class activity

You will need three ice cubes, three small plastic bowls (the three bowls must be of exactly the same kind), and three watches or timers.

Experiment: Time how long the ice takes to melt in three different environments – one in the sun, one in the shade, and one in a refrigerator. Have students identify which environment is the closest match to the Arctic. (L)

Observe: Every minute, take note of the changes that have occurred. Record the exact time for the ice to completely melt. (V, L)

Record: Record your information on a table. (S, L)

MULTIPLE INTELLIGENCES

The theory of multiple intelligences was developed by Howard Gardner, a professor of education at Harvard University. Howard Gardner's theory suggests that the current view of intelligence, as measured by IQ tests, is far too limited and discriminates against students who think in different ways. He proposes taking a broader perspective and has identified eight different intelligences. These are:

verbal-linguistic intelligence – word smart

logical-mathematical intelligence – number/ reasoning smart

spatial intelligence – picture smart

bodily-kinaesthetic intelligence – body smart

musical intelligence – music smart

interpersonal intelligence – people smart

intrapersonal intelligence – self smart

naturalist intelligence – nature smart

Multiple intelligences have enormous potential as a tool in furthering reading and language development. Traditionally, the teaching of language and reading has focused mainly on two intelligences: logical-mathematical and verbal-linguistic. This means that many students who possess different intelligences do not receive the necessary opportunities, encouragement, instruction, or reinforcement to succeed with reading as well as they might.

The Polar Bear Problem Name_____

Graphic Organizer (before and during reading)

Introduction

Kings of the Arctic

Clever Adaptations 1. 2. 3.	How the adaptation helps polar bears

Global Warming, Melting Ice

What Polar Bears Eat	Less Ice, Less Food	Less Food, Fewer Babies

Future Climate Change

Can Polar Bears Be Saved?	Act Now!

The Polar Bear Problem Name_____

Multiple Intelligences
Naturalist, Logical-mathematical

If you were an animal from this book, which one would you choose to be? Draw this animal in the box and write the pros and cons of being this animal.

Pros	Cons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

The Polar Bear Problem Name_____

Code Breaker

Unjumble these important words from the book and write the dictionary meaning for each.

Jumbled word	Page	Word	Dictionary meaning
tcnitex	4		
antinmod	6		
ingllewd	8		
oresivnrac	8		
bertvirate	9		
iotoclivasan	10		
eypr	13		
ierlacg	17		
ernatehib	22		

Build as many words as you can from the following letters:

GLOBAL WARMING

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

The Polar Bear Problem Name_____

Meaning Maker

Write a letter or email to your local politician to try to convince them of the need to act now to protect the environment and the animals that inhabit it. Use the box to plan your letter. Jot down notes, list words you would like to use, draw an idea web, and write down important facts to include. Then write your letter underneath.

The Polar Bear Problem Name_____

Text User

Use the book to help you answer these questions.

1. What is a layer of blubber?

_____

2. Can you name another animal with a layer of blubber?

_____

3. What is the dominant animal of the Arctic region?

_____

4. What do you think makes this animal dominant?

_____

5. How do polar bears communicate with one another?

_____

6. How can polar bears walk on the ice without slipping?

_____

7. What are the sources of the greenhouse gas problem?

_____

8. What is a maternity den?

_____

9. What do polar bear babies look like?

_____

10. What are the dangers that polar bears face from climate change?

_____

The Polar Bear Problem Name_____

◉ Text Critic

List all the features of this book that identify it as nonfiction.

_____

_____

_____

_____

_____

_____

Identify some problems for polar bears and other animals living on Earth. Think of some possible solutions to these problems.

Problem	Possible solutions

The Polar Bear Problem Name_____

Exposition (Proposition/Support)

Here are some answers. Think of a question that will make each answer correct.

Answer:	Question:
1. Arctic	_____
2. Polar bears	_____
3. Canada	_____
4. U*rsus maritimus*	_____
5. blubber	_____
6. papillae	_____
7. gas	_____
8. glacier	_____
9. seals	_____
10. maternity dens	_____
11. scientists	_____