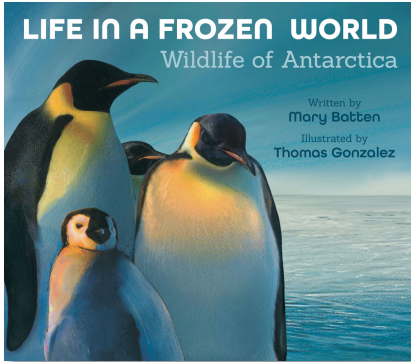




PEACHTREE

# TEACHER'S GUIDE

Includes Common Core Standards Correlations



## Life in a Frozen World: Wildlife of Antarctica

Written by Mary Batten | Illustrated by Thomas Gonzalez

HC: 978-1-68263-151-5

Ages 6–10  
F&P • GRL T; Gr 5

### ABOUT THE BOOK

Although a frozen continent, Antarctica supports a variety of wildlife on and around it. Bone-chilling cold and wind, combined with dry conditions, form a hostile environment but certain species have adapted to live there successfully. From the giant to microscopic algae that provide photosynthesis and the animals depending on these producers to support the food web, to the apex predators reliant on the sea ice and life there, Antarctica forms a delicate and balanced ecosystem that has thrived for ages. Unfortunately, changes have begun that may upset the balance and eliminate many of the life forms that call it home. As author Mary Batten writes, “Antarctica’s creatures depend on the ice. In the long term, so do we.”

### THEMES

Ecosystems | Food webs | Survival  
Adaptations | Changing climate  
Environmental awareness  
Plant and animal life

### SKILLS

Listening | Main idea | Vocabulary development  
Critical thinking | Comprehension | Connecting concepts

### BEFORE YOU READ

**RI.1.3, RI.1.6, RI.2.3, RI.2.7, RI.3.3, RI.3.7, RI.4.3, RI.4.7, RI.5.3**

- Show the students the endpapers and ask if they recognize what is occurring. Then explain the Aurora Australis (Southern Lights) and discuss

where they could see them. Show the video to explain them:

<https://www.youtube.com/watch?v=nHn5001t1yc>

Compare the two Auroras.

- Show several of the spreads. Ask what they think this book will be about.
- Tell them it’s a book about Antarctica and the life there. Discuss the climate in Antarctica and ask what kinds of life they know of that live here.
- Show the location of Antarctica on a globe. Discuss the fact that it is a continent while the Arctic is not and explain why.

### AS YOU READ

**RI.1.3, RI.1.4, RI.2.3, RI.2.4, RI.3.3, RI.3.4, RI.4.3, RI.4.4, RI.5.3, RI.5.4**

- Read the first page. Ask what the author means by the coldest, windiest, driest place on Earth. Use the NASA information here to describe it:  
<https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-antarctica-k4.html>
- Ask the students to look for examples of how the life depends on one another and to look for ways the animals have adapted or fit in to live there successfully.

### AFTER YOU READ

- Have the students identify the kind of book it is—fiction or nonfiction—and explain why. **RL.1.5**
- Discuss how the different life forms depend on one another and why they need this. **RI.1.1, RI.1.3, RI.1.8, RI.2.1, RI.2.3, RI.2.8, RI.3.1, RI.3.3, RI.4.1, RI.4.3, RI.4.8, RI.5.1, RI.5.3, RI.5.8**

- Ask students why they think it took so long for people to discover Antarctica. **RI.1.1, RI.2.1, RI.3.1, RI.4.1, RI.5.1**
- Observe the people in the art as a class. Describe what they are wearing and explain why they need those sorts of clothing. **RI.1.7, RI.2.7, 3.7, 4.7**
- Ask each person if they would like to visit Antarctica and have them tell why or why not.
- For more information about Antarctica, show the video to reinforce the book's concepts:  
<https://www.youtube.com/watch?v=t3StWheKtq8>  
**RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4**

## CURRICULUM CONNECTIONS

### LANGUAGE ARTS

- Hold up the book and identify the parts of the book: front and back cover, title page.
- Name the author and illustrator and discuss the part they played in making the book. Show several examples of the books Mary Batten has written. How do they compare and contrast? Show Thomas Gonzalez's website (<http://www.tomprints.com/>) and look at some of the examples of his art in other books or show some of his other books to compare the art. Discuss the style he uses and how they compare.
- Discuss what the book is about. Identify the main idea and find details from the book that support the main idea. **RI.1.2, RI.2.2, RI.3.2, RI.4.2, RI.5.2**
- Discuss how the art and the words work together to tell the story and the part each plays to provide information. **RI.1.6, RI.2.7, RI.3.7, RI.4.7**
- Ask what students can tell you about the climate in Antarctica from the animal adaptations and the illustrations. **RI.1.1, RI.1.6, RI.2.1, RI.2.7, RI.3.1, RI.3.7, RI.4.1, RI.4.7, RI.4.1**
- Explain why melting ice in Antarctica is not good for the environment and the life living there. **RI.4.3**
- Show a video of a penguin walking.  
[https://www.youtube.com/watch?v=COA\\_vgQjR6s](https://www.youtube.com/watch?v=COA_vgQjR6s)  
Ask students to identify a specific skill penguins have to obtain food and give examples from the book to support their reasoning. Discuss why it would be difficult for a penguin to obtain food on land. After the discussion, show the video of penguins feeding.  
<https://video.nationalgeographic.com/video/news/00000144-0a32-d3cb-a96c-7b3fb7110000> **RI.1.1, RI.2.1, RI.3.1, RI.4.1, RI.5.1**

- What text features are used in the book? How do they help you understand what the book is about? For older students, what is the overall text structure and how does that provide information? **RI.1.6, RI.1.7, RI.2.5, RI.3.5, RI.4.5, RI.5.5**
- Discuss what can be done to help prevent a warming climate so that Antarctica remains as it is. **RI.1.1, RI.2.1, RI.3.1, RI.4.1, RI.5.1**

### VOCABULARY

**RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4**

- Show the YouTube video of a calving glacier.  
<https://www.youtube.com/watch?v=Y-9foDzGKwg>  
(may contain ad at first)
- Discuss the danger that exists when a glacier calves.
- Read the examples of other keystone species. Compare and contrast one of them to the keystone species of krill in Antarctica and what would happen if they disappeared.  
<https://examples.yourdictionary.com/examples-of-keystone-species.html>
- Divide the class into small groups. Assign each group a vocabulary word. Define the word and use it in context in a sentence. Ask the groups to draw a picture to help illustrate the meaning. Each group will present their word.

species	kind or sort
evolved	changed to fit in over time
microscopic	tiny or very small
phytoplankton	a kind of algae
krill	a shrimp-like small animal
keystone species	a group that supports the ecosystem
gills	take oxygen from water
antifreeze	substance that keeps things from freezing
blubber	a thick layer of fat
baleen	long strips in whales that strain out their food
molt	to shed or lose
blizzard	snow storm with blowing snow
invertebrates	without a backbone
pristine	pure and clean
organism	a living thing
bedrock	the rock below the surface
humidity	the amount of water in the air
calving	ice breaking off a glacier

**WRITING****W.1.1, W.1.2, W.2.1, W.2.2, W.3.1, W.3.2, W.4.1, W.4.2, W.5.1, W.5.2**

- Ask students to choose a favorite animal discussed in the book and tell why using facts from the book. Older students can research more facts about their favorite animal.
- Have each child write a paragraph about the consequences of the ice melting in Antarctica.
- Ask students to write a poem based on one of the vocabulary words listed in the vocabulary section of this guide. **RI.1.4, RI.2.4, RI.3.4, RI.4.4, RI.5.4**

**SCIENCE (NGSS)**

**LS2.A: Interdependent Relationships in Ecosystems, LS4.D: Biodiversity and Humans, ESS2.C: The Roles of Water in Earth's Surface Processes, LS3.A: Inheritance of Traits LS2.C: Ecosystem Dynamics, Functioning, and Resilience, LS4.C: Adaptation, LS4.D: Biodiversity and Humans, Science ESS2.D: Weather and Climate, LS1.A: Structure and Function, LS1.D: Information Processing, LS1.C: Organization for Matter and Energy Flow in Organisms, LS2.A: Interdependent Relationships in Ecosystems, ESS3.C: Human Impacts on Earth Systems**

- Ask students to create a food chain that exists in Antarctica using words and arrows to show the energy flow. Have volunteers share their food chain. Younger students can draw an example of a food chain.
- Discuss why algae is so important in the Antarctic food chain. What would happen if it disappeared?
- In small groups, describe the adaptations of one animal in the Antarctic and explain why those adaptations are important.
- Read about ice cores <https://climate.nasa.gov/news/2616/core-questions-an-introduction-to-ice-cores/> and describe how and what kind of information ice cores provide to scientists.
- The weather in Antarctica is extreme. Have students cite evidence from the book and illustrations to support that statement.
- Individually or in small groups, have students research one of the life forms from the book. Make a poster to present the information about that organism. Include a picture of the animal as well.

**SOCIAL STUDIES****RI.1.1, RI.2.1, RI.3.1, RI.4.1, RI.5.1**

- Ask students, in what ways are the seasons in the Southern Hemisphere different from the seasons in the Northern Hemisphere? Ask them to identify another difference in the two hemispheres (hint: look at the endpapers).

- Discuss the 1959 Antarctic Treaty. Why did it happen and for what purpose? Is it a good idea?

**MATH****1.OA.C.6, 3.NBT.A.2, 4.OA.A.2, 4.NBT.B.4, 5.NBT.A.3.B, 5.NBT.B.5, 5.NBT.B.7, 5.NBT.B.7**

- “A blue whale can eat four tons of krill a day.” As a class, calculate how many pounds of krill this would be.
- “A meter of sea-level rise comes from only two percent change in the Antarctic ice sheet, and a meter of sea-level rise displaces a hundred million people around the planet.” —Gary Wilson, Professor of Marine Science Otago University, New Zealand As a class, calculate what sea-level rise would come from a four percent change in the Antarctic ice sheet. Then convert that rise into feet or yards.

**ART**

- Ask students to draw a picture of a whale using its baleen to feed.
- Next, ask students to draw two examples of invertebrates found in and around Antarctica. Label the drawings. Post the pictures.
- Show the video of penguins making their nest. <https://www.youtube.com/watch?v=6RdYbv6Y2AM> Students can then use drawing paper to create an image of a penguin on its nest.

**ABOUT THE AUTHOR**

Mary Batten, an award-winning writer for television, film, and publishing, was nominated for an Emmy for her work on the Children's Television Workshop's science series *3-2-1 Contact* and has written more than fifty nature documentaries for television, including the syndicated series *Wild Wild World of Animals*. She lives in Virginia.

[www.marybatten.com](http://www.marybatten.com)

**ABOUT THE ILLUSTRATOR**

Thomas Gonzalez was born in Havana, Cuba, and moved to the United States as a child. An artist and painter, he directed campaigns for clients such as Coca-Cola, Delta Airlines, NASCAR, the NFL, and McDonald's, in addition to illustrating children's books. He lives in Georgia.

[www.tomprints.com](http://www.tomprints.com)

Peachtree Teacher's Guide  
prepared by Shirley Duke

Copyright ©2020 by Peachtree Publishing Company Inc. All rights reserved. For instructional uses only and not for resale. Except for the printing of complete pages, with the copyright notice—no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopy, recording, or any other without written permission. Requests for permission to use any section of the work should be mailed to: Permissions Department, Peachtree Publishing Company Inc., 1700 Chattahoochee Avenue, Atlanta, GA 30318-2112.

404-876-8761 • 800-241-0113

[www.peachtree-online.com](http://www.peachtree-online.com)

updated 3/16/20

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

## ACTIVITY SHEET 1 – FILL IN THE BLANKS

Use the information in the book to answer the questions.

1. \_\_\_\_\_ don't grow in Antarctica.
2. Photosynthesis is carried on by \_\_\_\_\_ in Antarctica.
3. Algae is the main food source of \_\_\_\_\_.
4. Krill are the \_\_\_\_\_ of the Antarctic food chain.
5. Life in the Antarctic have \_\_\_\_\_ to live in the harsh environment.
6. Icefish produce a natural \_\_\_\_\_ protein to keep their blood from freezing.
7. A thick layer of insulated fat called \_\_\_\_\_ protects whales from the freezing water.
8. \_\_\_\_\_ acts as a strainer in certain whales to get their food.
9. Waterproof feathers, a layer of soft, warm down, and a thick layer of fat helps protect \_\_\_\_\_ from the cold.
10. Animals without backbones are \_\_\_\_\_.
11. The only continent protected for peace and science is \_\_\_\_\_.
12. Over millions of years, life in Antarctica has \_\_\_\_\_ to live there successfully
13. The atmosphere and ocean are \_\_\_\_\_ around the western Antarctica Peninsula.
14. In summer, \_\_\_\_\_ carry out different kinds of studies about Antarctica.
15. Antarctica's climate history can be seen in \_\_\_\_\_.
16. Large species of algae that krill prefer to eat is being replaced by smaller species as a result of \_\_\_\_\_ sea ice.
17. A warming temperature in Antarctica has caused the \_\_\_\_\_ to increase, causing the melting ice to drown penguin eggs.
18. Antarctic \_\_\_\_\_ are melting.
19. Glaciers are \_\_\_\_\_ at a faster rate due to a warming climate.
20. Melting Antarctic land ice will lead to a \_\_\_\_\_ in sea levels.

### WORD BANK

adapted  
 algae  
 Antarctica  
 antifreeze  
 baleen  
 blubber  
 calving  
 evolved  
 humidity  
 ice cores  
 ice shelves  
 invertebrates  
 keystone species  
 krill  
 penguins  
 researchers  
 rise  
 shrinking  
 trees  
 warming

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

1. \_\_\_\_\_ don't grow in Antarctica. (Trees)
2. Photosynthesis is carried on by \_\_\_\_\_ in Antarctica. (algae)
3. Algae is the main food source of \_\_\_\_\_. (krill)
4. Krill are the \_\_\_\_\_ of the Antarctic food chain. (keystone species)
5. Life in the Antarctic have \_\_\_\_\_ to live in the harsh environment. (adapted)
6. Icefish produce a natural \_\_\_\_\_ protein to keep their blood from freezing. (antifreeze)
7. A thick layer of insulated fat called \_\_\_\_\_ protects whales from the freezing water. (blubber)
8. \_\_\_\_\_ acts as a strainer in certain whales to get their food. (Baleen)
9. Waterproof feathers, a layer of soft, warm down, and a thick layer of fat helps protect \_\_\_\_\_ from the cold. (penguins)
10. Animals without backbones are \_\_\_\_\_. (invertebrates)
11. The only continent protected for peace and science is \_\_\_\_\_. (Antarctica)
12. Over millions of years, life in Antarctica has \_\_\_\_\_ to live there successfully. (evolved)
13. The atmosphere and ocean are \_\_\_\_\_ around the western Antarctica Peninsula. (warming)
14. In summer, \_\_\_\_\_ carry out different kinds of studies about Antarctica. (researchers)
15. Antarctica's climate history can be seen in \_\_\_\_\_. (ice cores)
16. Large species of algae that krill prefer to eat is being replaced by smaller species as a result of \_\_\_\_\_ sea ice. (shrinking)
17. A warming temperature in Antarctica has caused the \_\_\_\_\_ to increase, causing the melting ice to drown penguin eggs. (humidity)
18. Antarctic \_\_\_\_\_ are melting. (ice shelves)
19. Glaciers are \_\_\_\_\_ at a faster rate due to a warming climate. (calving)
20. Melting Antarctic land ice will lead to a \_\_\_\_\_ in sea levels. (rise)

### WORD BANK

adapted  
algae  
Antarctica  
antifreeze  
baleen  
blubber  
calving  
evolved  
humidity  
ice cores  
ice shelves  
invertebrates  
keystone species  
krill  
penguins  
researchers  
rise  
shrinking  
trees  
warming