



NSDL/NSTA Web Seminar
Beyond Penguins and Polar Bears-
Arctic and Antarctic Birds



Tuesday, April 21, 2009



Today's NSDL Experts



Jennifer Fee, BirdSleuth Project Leader,
Cornell Lab of Ornithology



Colleen McLinn, Education Outreach Associate,
Cornell Lab of Ornithology



Jessica Fries-Gaither, *Beyond Penguins and Polar Bears* Project Director and Elementary Resource Specialist, Ohio State University



<http://nsdl.org>



<http://beyondpenguins.nsdl.org>



<http://www.birds.cornell.edu/>





Overview of Presentation

1. Teaching about birds in the classroom through inquiry
2. Teaching physical science using polar birds
3. Integrating science and literacy strategies
4. Citizen Science



Resource list for tonight's presentation:
<http://www.diigo.com/list/nsdlworkshops/web-sem-birds>



<http://nsdl.org>





Resources from *Beyond Penguins and Polar Bears*: Issue 11, February 2009

The screenshot shows the homepage of the "Beyond Penguins and Polar Bears" website. The header includes the site logo, navigation links (HOME, CONTRIBUTORS, STORIES FOR STUDENTS, BROWSE BY COUNTRY, ARCHIVE, PODCASTS, CHANGE LANGUAGE), a Google search bar, and a "SEARCH" button. Below the header is a navigation bar with categories: PROFESSIONAL LEARNING, SCIENCE AND LITERACY, ACROSS THE CURRICULUM, IN THE FIELD: SCIENTISTS AT WORK, and POLAR NEWS AND NOTES. The main content area features a large image of a giant petrel in flight over a snowy landscape. To the right of the image is the title "ARCTIC AND ANTARCTIC BIRDS - ISSUE 11, FEBRUARY 2009" and a paragraph of text about the issue's focus on polar birds. Below this is a photo credit: "Photo: A giant petrel in flight near Palmer Station, Anvers Island, Antarctica. Photo courtesy of Henry Malmgren, National Science Foundation." The bottom section is divided into five columns, each with a category title and a list of resources. The categories are: PROFESSIONAL LEARNING, SCIENCE AND LITERACY, ACROSS THE CURRICULUM, IN THE FIELD: SCIENTISTS AT WORK, and POLAR NEWS AND NOTES. To the right of these columns is a "Contributors (View All)" section featuring three contributors: Jennifer Fee, Colleen McLinn, and Eleanor Lynette Rayle, each with a small portrait and a brief description of their expertise.

BEYOND PENGUINS AND POLAR BEARS an online magazine for k-5 teachers

HOME | CONTRIBUTORS | STORIES FOR STUDENTS | BROWSE BY COUNTRY | ARCHIVE | PODCASTS | CHANGE LANGUAGE

Google Custom Search SEARCH

PROFESSIONAL LEARNING SCIENCE AND LITERACY ACROSS THE CURRICULUM IN THE FIELD: SCIENTISTS AT WORK POLAR NEWS AND NOTES

ARCTIC AND ANTARCTIC BIRDS - ISSUE 11, FEBRUARY 2009

Sure, you've heard of emperor penguins...but what about giant petrels, skuas, or sanderlings? This issue, co-produced with the Cornell Lab of Ornithology, explores the amazing birds that live in or migrate to the polar regions. Read about how birds stay warm, or get an inside look at an expedition to record bird and other animal sounds in the high arctic. Discover professional resources about social networking and engaging boys in reading. Our featured lessons help you use the subject of birds to teach simple physics concepts.

Photo: A giant petrel in flight near Palmer Station, Anvers Island, Antarctica. Photo courtesy of Henry Malmgren, National Science Foundation.

PROFESSIONAL LEARNING

- Science Content Knowledge
- Literacy Content Knowledge
- Misconceptions
- Integrating Technology
- Teaching and Assessment Strategies
- Equity in the Classroom
- Professional Bookshelf
- Podcast

SCIENCE AND LITERACY

- Lessons and Activities
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IN THE FIELD: SCIENTISTS AT WORK

- Researcher Stories
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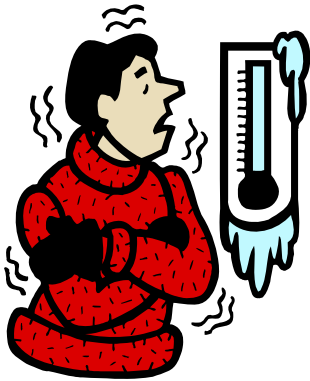
<http://nsdl.org>

<http://beyondpenguins.nsdl.org>





How do birds stay warm?



Do they shiver or put coats on, like humans?

Type your responses in the chat





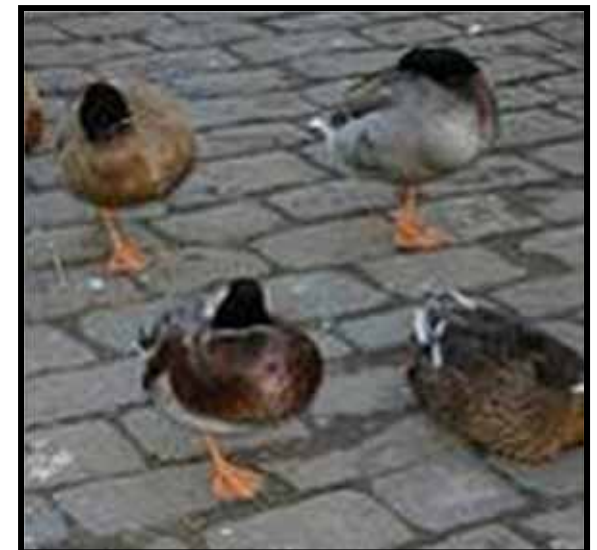
YES (sort of)
Birds' feathers provide lots of insulation!



- **Do they wear a coat?**
 - Puff up
- **Hat, scarf and gloves?**
 - Tuck their bills
 - Stand on one leg
 - A few birds have feathers on their feet




- **Do they shiver?**
 - Yes!





Arctic and Antarctic Birds - Issue 11, February 2009 • Professional Learning



The South Polar skua is the most southerly bird in the world. Although they live around the coastal edge of Antarctica, they have been seen flying over the South Pole, over 2,000 km (1,250 miles) from the coast. Photo courtesy of Ariana Owens, National Science Foundation.

In this department, you'll increase your own content knowledge. Learn about the science of the polar regions and literacy skills that you will teach in the featured lessons and activities. Consider the many misconceptions that are held about the polar regions. Learn how to make your teaching practices accessible for all students. Professional Learning includes columns such as: Science Content Knowledge, Literacy Content Knowledge, Misconceptions, Integrating Technology, Teaching and Assessment Strategies, and Equity in the Classroom.

SCIENCE CONTENT KNOWLEDGE
[How Do Birds Stay Warm?](#)
by Jennifer Fee

LITERACY CONTENT KNOWLEDGE
[Questioning to Understand Content Area Text](#)
by Jessica Fries-Gaither

MISCONCEPTIONS
[Common Misconceptions about Birds](#)
by Jessica Fries-Gaither

INTEGRATING TECHNOLOGY
[Integrating Technology: Social Networking](#)
by Kimberly Lightle

TEACHING AND ASSESSMENT STRATEGIES
[Kids Becoming Scientists through Schoolyard Inquiry](#)
by Jennifer Fee

EQUITY IN THE CLASSROOM
[Strategies to Engage Boys in Reading \(and the Girls, Too\)](#)
by Jessica Fries-Gaither

PROFESSIONAL BOOKSHELF
[Professional Bookshelf: Resources for Teachers](#)
by Jessica Fries-Gaither

NSES standards

- Organisms in environments (physical and behavioral adaptations)
- Diversity and characteristics of organisms (form and function)
- Life cycles of organisms (migration)
- Characteristics and changes in populations (conservation)



Learn Through Inquiry!

We encourage kids to ask and answer their own questions!



Arctic and Antarctic Birds - Issue 11, February 2009 Professional Learning



The South Polar skua is the most southerly bird in the world. Although they live around the coastal edge of Antarctica, they have been seen flying over the South Pole, over 1,675 km (1,040 miles) from the coast. Photo courtesy of Ariana Owens, National Science Foundation.

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[Professional Bookshelf: Resources for Teachers](#)

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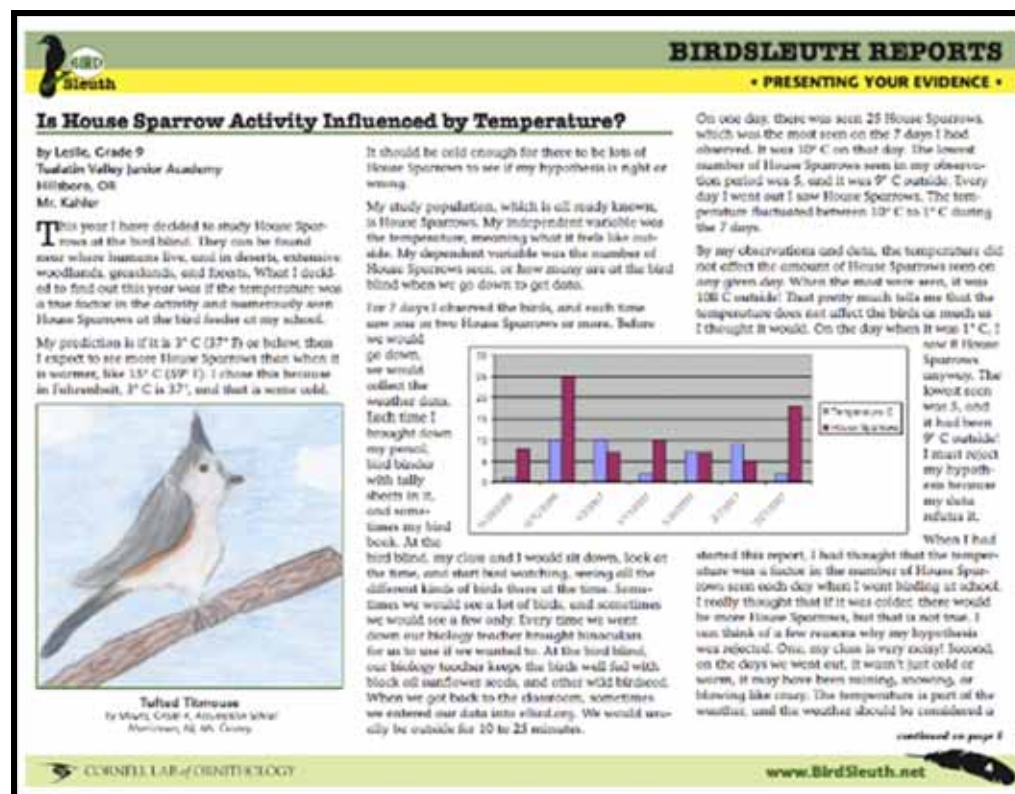
PODCAST

[Birdwatcher's Delight: Birds and Inquiry Learning: Podcast Episode 3](#)

by Stephanie Chasteen, Jennifer Fee, Robert Payo



Kids can do their own research!



See our student publications:
Classroom BirdScope and BirdSleuth Reports
www.BirdSleuth.net/student-research



Arctic and Antarctic Birds - Issue 11, February 2009 Science and Literacy



In this department, you'll discover resources that effectively combine hands-on science experiences with reading, writing, and oral discourse. Your students will enjoy reading the feature story, an engaging look at the science content of this issue that also provides an opportunity to practice comprehension strategies. Find other titles for classroom use in our virtual bookshelf. View teacher-submitted lesson plans and samples of student work, or share your own. Science and Literacy includes columns such as: Lessons and Activities, Feature Story, Classroom Vignettes, Virtual Bookshelf, and Student and Teacher Work.

LESSONS AND ACTIVITIES

[Hands-on Science and Literacy Lessons About Birds](#)
by Jessica Fries-Gaither

FEATURE STORY

[The Dance of Life](#)
by Stephen Whitt

VIRTUAL BOOKSHELF

[Birds Virtual Bookshelf](#)
by Kate Hartman

STUDENT AND TEACHER WORK

[Students Research Bird Behavior in Cold Weather](#)
by Jennifer Fee

Students Research Bird Behavior in Cold Weather

by Jennifer Fee

Each year, the Cornell Lab of Ornithology publishes the research of students involved in the BirdSleuth program. By coming up with questions, conducting original investigations, and sharing their findings, students participate in the scientific process. This article was submitted by a fourth-grade class in New Haven, New York.

This investigation was designed and carried out by the 24 students of the 2005-06 4th grade class at New Haven Elementary School in New Haven, NY. This report was written by Nick, Kristen, Austin and Becca.

Introduction

After observing birds at our courtyard feeding station from September through December, several of us noticed that sometimes the birds, especially the Mourning Doves, would puff up their feathers. Nick wondered if cold temperatures caused this behavior and suggested the following investigation.

Hypothesis

Birds at our feeding station will puff up their feathers when the ambient temperature is below 32 degrees F.

Materials

- Outdoor thermometer
- Data sheets





Join our email list:



This material is based upon work supported by the National Science Foundation under Grant No. 0242666. Any opinions, findings, and conclusions or recommendations

Investigating Evidence

Click on each Investigation to see and download the Teacher Guide, Resource Pages, Investigator's Journal, Online Supports, and Links associated with that topic!

[Investigation 1: What is Science?](#)

Students will meet some of our Lab scientists and learn about the science process through their exciting work.

[Investigation 2: Testing Hypotheses](#)

Designing your own experiments is fun and demands creative thinking!

[Investigation 3: Show Me the Data](#)

Students learn how to share their conclusions visually through graphs.

[Investigation 4: Plan and Conduct Investigations](#)

It's an exciting challenge to plan and implement your own investigation!

[Investigation 5: Presenting Inquiry Projects](#)

Sharing what you've learned is a critical part of the science process.

**Get your FREE copy at
www.BirdSleuth.net!**



Let's pause for
questions from
the audience....



Teaching Physical Science Concepts with Polar Birds



<http://nsdl.org>



Birds: What are they good for?






Amazing Birds lessons




AMAZING BIRDS

Brenda Neal, Lyons Central School
Jennifer Baxter, Palmyra-Macedon Central School
Sharon Bassage, Wayne-Finger Lakes BOCES
Colleen McLinn, Ph.D., Cornell Lab of Ornithology


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 CORNELL LAB of ORNITHOLOGY
Wayne-Finger Lakes Board of Cooperative Educational Services

This material is based upon work supported by the National Science Foundation under DUE 0652786. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.




Physical Adaptations
Lesson 2




Sound is Energy
Lesson 3




Why Birds Sing
Lesson 4



Bird Beaks
Lesson 5



Flight and Feathers
Lesson 6



<http://macaulaylibrary.org/physics>








<http://nsdl.org>

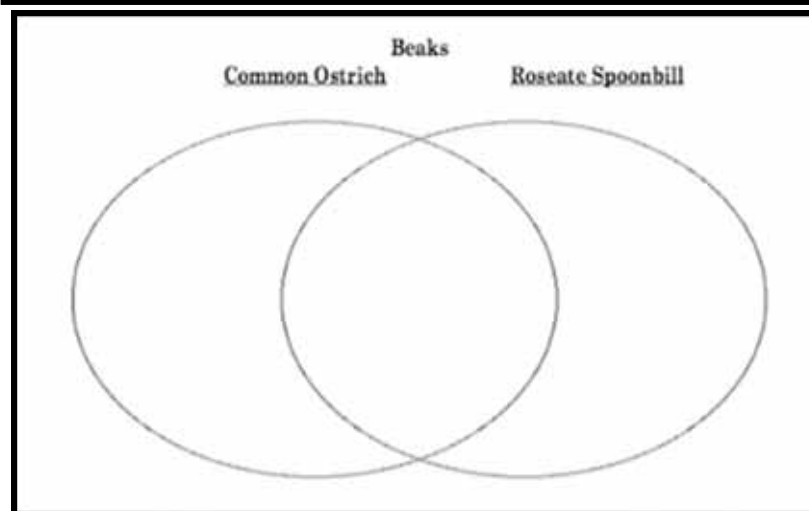




Physical Adaptations

	FEET	MOVEMENT	BEAK	COLOR
	Long talons for catching and holding food.		Hooked for tearing food.	Brown like the earth they dig in.
Hudsonian Godwit	Legs are long to get above the water and see food.	Long strides, walking.	Long, pointed beak for probing.	
American Woodcock			Long, thin beak for probing in dirt for food.	Browns and camouflaged to forest floor.
Common Ostrich	Big, wide feet so the bird won't sink in to the ground.	Long, walking or running strides.	Large, wide, strong.	
Atlantic Puffin	Wide, webbed for swimming.	Waddles, swims, flies.	Short, cone-shaped, strong for catching fish.	
Pileated Woodpecker	Two toes point opposite others for grip.		Long, strong for pecking into tree for insects.	
Roseate Spoonbill			Large, wide, spoon-shaped to scoop small food items from the water.	Pink for attracting a mate.
Mallard	Wide, webbed for swimming.	Waddles, swims, flies.		Male is colorful, female is brown and camouflaged.
White-tailed Ptarmigan	Feathered feet to deal with snow.			White in winter for camouflage with snow.
Crested Caracara	Large talons to hold the food down.		Sharp, curved for tearing food.	
Common Yellowthroat	Grasping branch.			Bright yellow chest to attract mate.
White-throated Sparrow	Uses its feet to kick up leaves to find food.	Hopping and kicking up the leaves.		Brown for camouflage.
Golden Eagle	Talons grab fish.	Flying, soaring		

Discuss: Ask some open-ended questions while watching the videos. "What are the different ways that birds get around?" "What are the different ways that birds get food?" "Which birds have you seen around your house?" "Other than eating, what do birds use their beaks for?" "What colors are the birds?" "Have you seen any of these behaviors in the birds at our feeder?"




Beaks as simple machines

Name: _____ Activity Sheet 8: Natural Tools

How does a bird's beak work like a simple machine?

1. Match the beak to the tool it is similar to.







The activity sheet displays five birds on the left and five tools on the right. The birds are: a pelican, a falcon, a hummingbird, a robin, and a woodpecker. The tools are: a pair of pliers, a knife, a pair of pliers, a net, and a pair of tweezers. The birds are arranged vertically, and the tools are arranged vertically to their right.





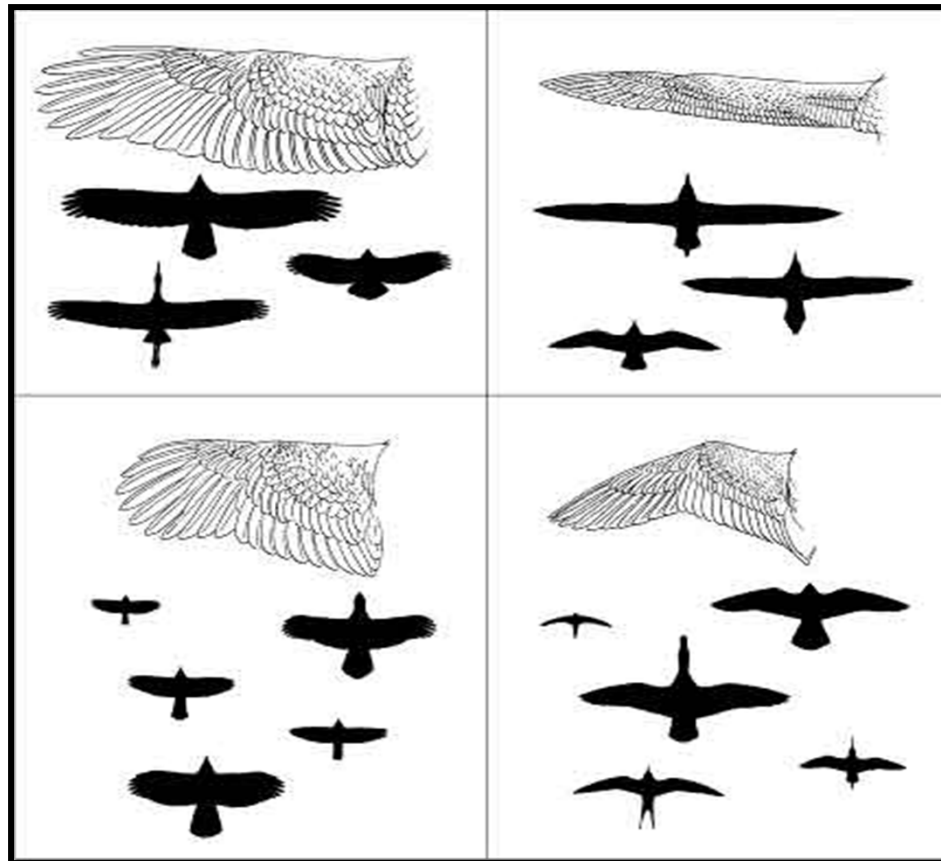
Beaks as simple machines

	PONY BEADS	RUBBER BUGS	PLASTIC LEAVES
BEAK TYPE			
 Chopsticks			
 Toothpicks			
 Tongs			
 Clothespins			



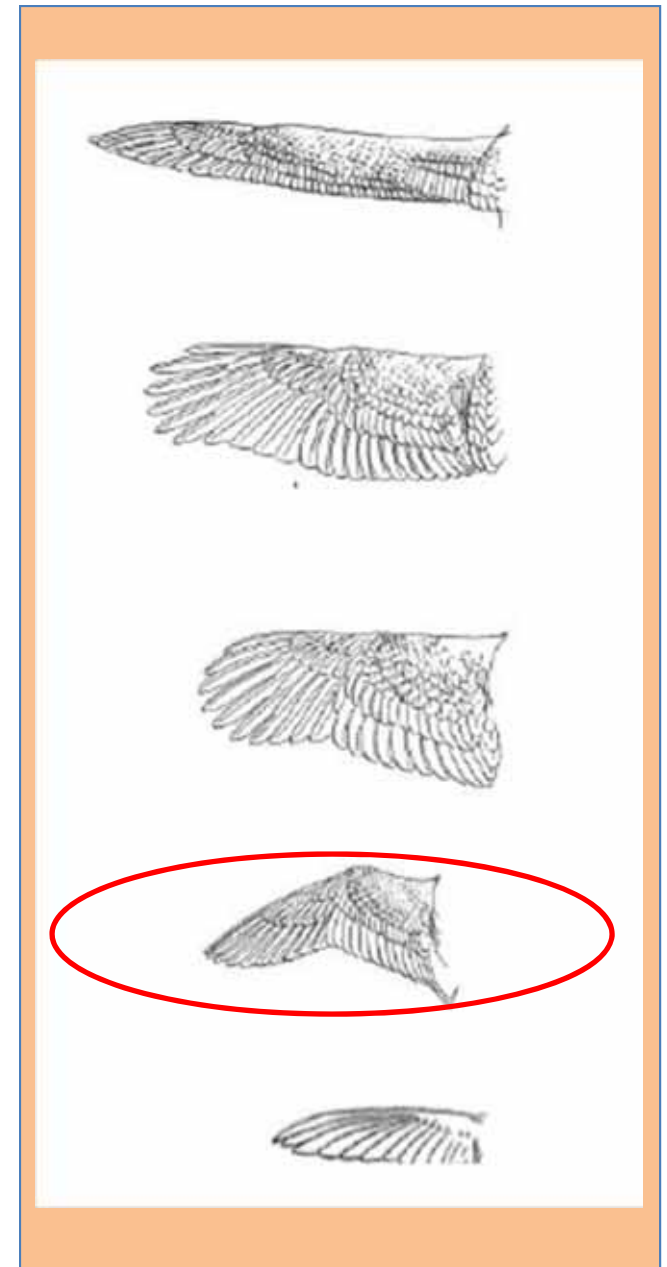


Wing shapes, flight and migration



For what type of flight is the wing circled in red used? Stamp your answer

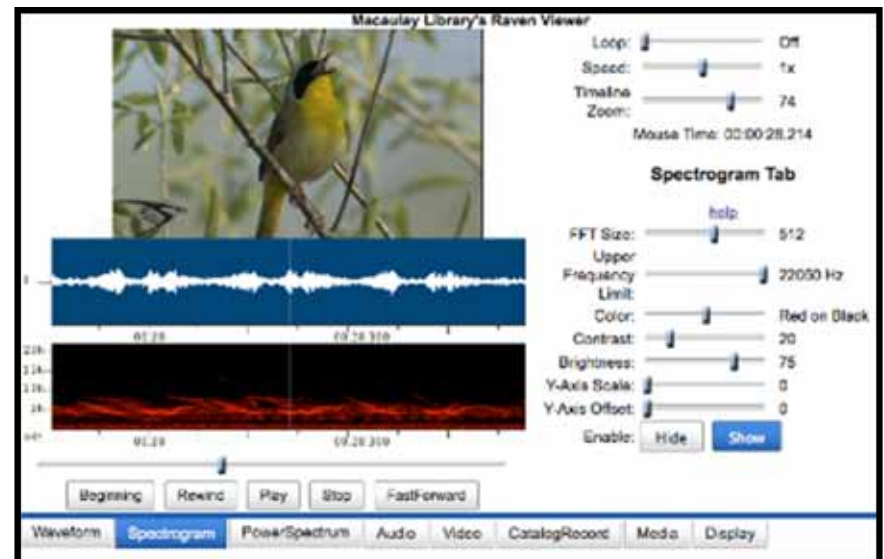
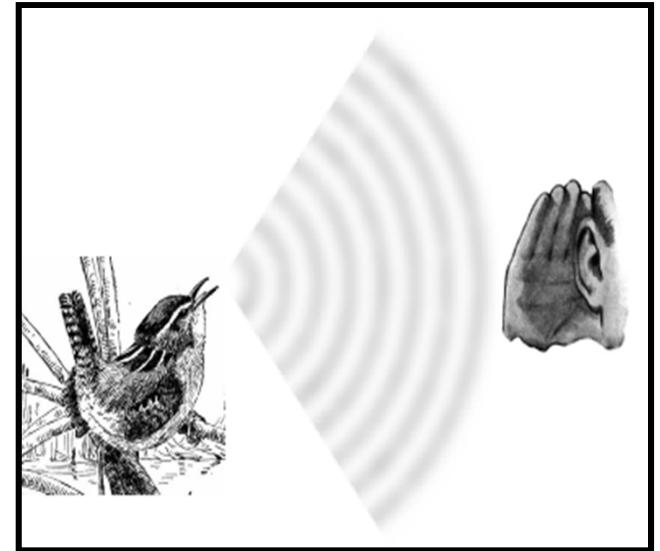
Rapid takeoff/easy turns	Soaring up high
Hovering	High Speed
Gliding over water	None of these





How and Why Do Birds Make Sound?

Angry	Warning
Sad	Nervous





Let's pause for
questions from
the audience....



Integrating Science and Literacy: Resources from *Beyond Penguins and Polar Bears*

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- Professional Bookshelf
- Podcast

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[Arctic and Antarctic Birds - Issue 11, February 2009](#) » [Science and Literacy](#) » [Feature Story](#)

The Dance of Life

by Stephen Whitt

“Sanderlings are **migratory** birds. Each spring, they leave beaches in Florida, the Caribbean, and South America and travel to the Arctic to nest and raise their young. Some travel almost halfway around the Earth.”



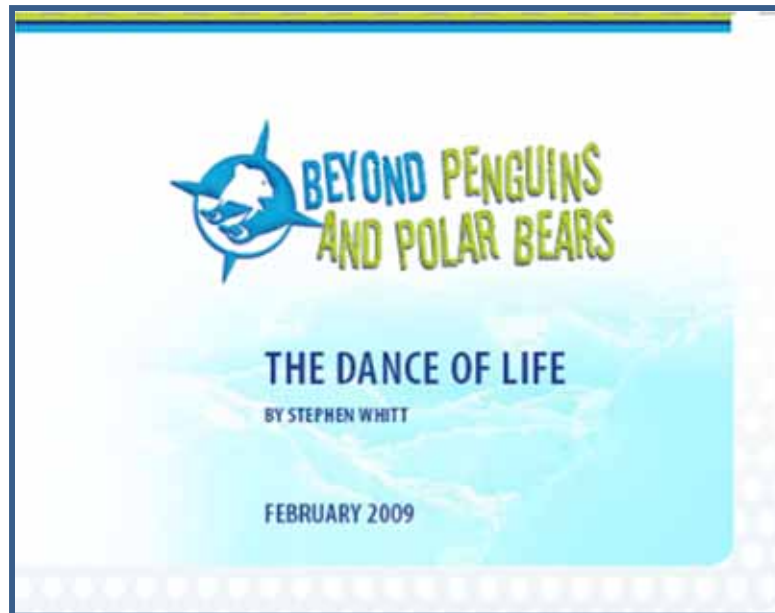
<http://nsdl.org>



Feature Story:

Available for grades K-1, 2-3, and 4-5 as:

- Text-only
- Illustrated book
- Electronic book



The Dance of Life



As the water retreats, tiny animals scurry to bury their sand-colored shells in the sand. These are mole crabs. One is caught and pulled up in a jet-black beak. The hunter, a small dusty-white bird with long legs and delicate feet, scrambles up the beach to escape the waves.



credit: Maudsley Library,
Cornell Lab of Ornithology

As she runs from the water, she swallows a mole crab whole, then turns to look for more. She is a type of shore bird called a **sanderling**.



1 2 3 4 5 6 7 8 9 10 11 12 13 14



Credit: Copyright Feb 2009, The Ohio State University



<http://nsdl.org>



Question-Answer Relationship

Four categories of questions

Right There

Think and Search

Author and Me

On My Own



BEYOND PENGUINS AND POLAR BEARS an online magazine for k-5 teachers

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PROFESSIONAL LEARNING SCIENCE AND LITERACY ACROSS THE CURRICULUM IN THE FIELD: SCIENTISTS AT WORK POLAR NEWS NOTES

Arctic and Antarctic Birds - Issue 11, February 2009 • Professional Learning • **Literacy Content Knowledge**

Questioning to Understand Content Area Text

by Jessica Fries-Gaither

As teachers, we're well versed in the art of questioning. In fact, research shows that teachers typically spend anywhere from 35 to 50 percent of their instructional time asking questions. While there's no denying that this is a valuable instructional tool, teaching students to ask their own questions is also critical.

Read each question, and label it with one of the four types of QARs.
Then answer the question. Remember that the four types of QARs are:

- In the Book: Right There
- In the Book: Think and Search
- In My Head: On My Own
- In My Head: Author and Me

1. What do sanderlings eat?

QAR type: _____

Answer: _____

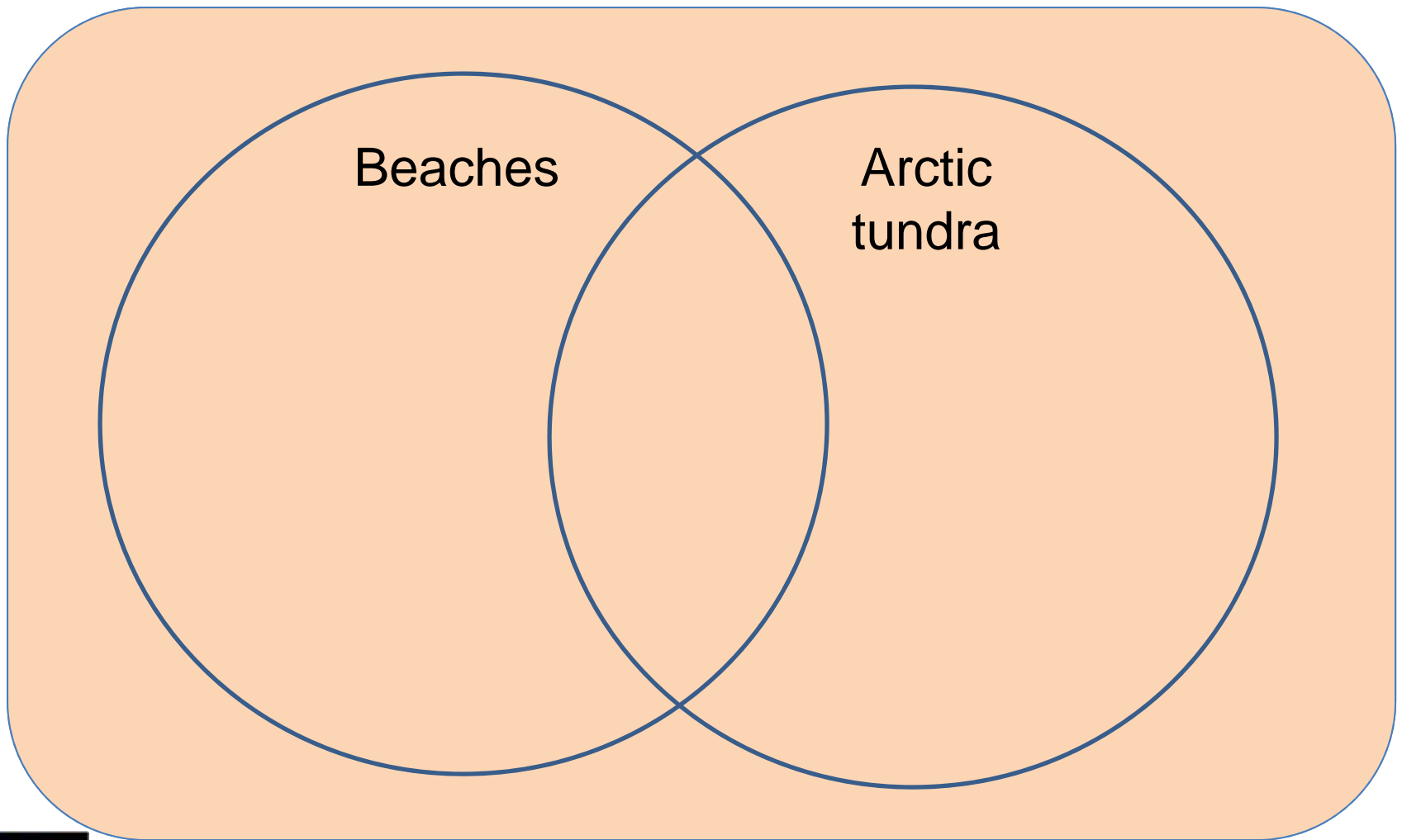
QAR template
created for use
with Feature
Story



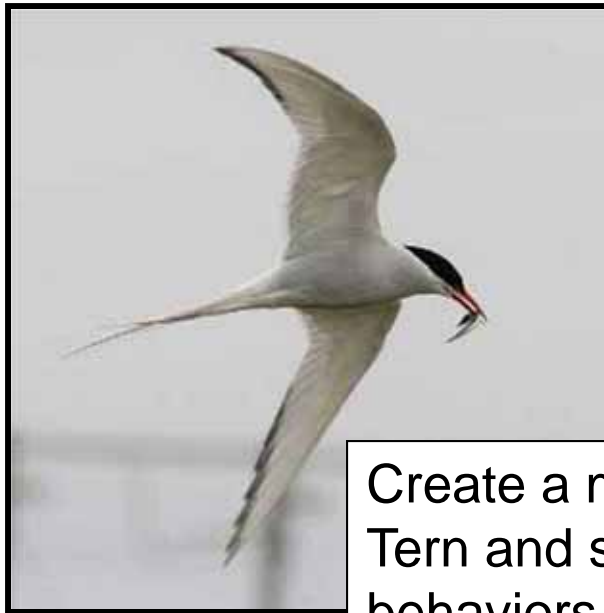
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Compare and contrast sanderling habitats



Migration



Map migration routes
and develop
geographic awareness

Create a model Arctic
Tern and simulate
behaviors and migration

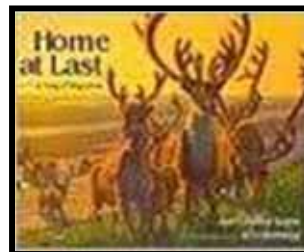
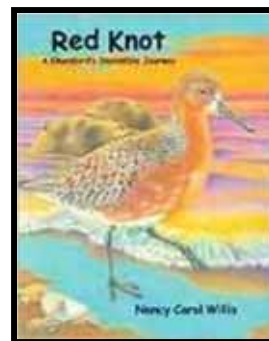
Read
children's
literature

The Dance of Life

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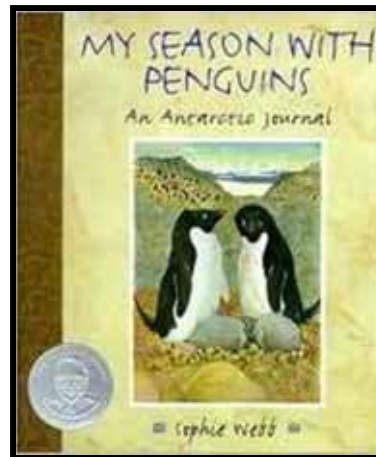
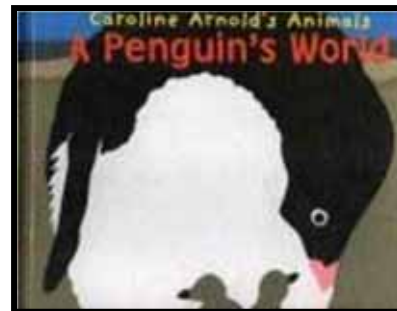
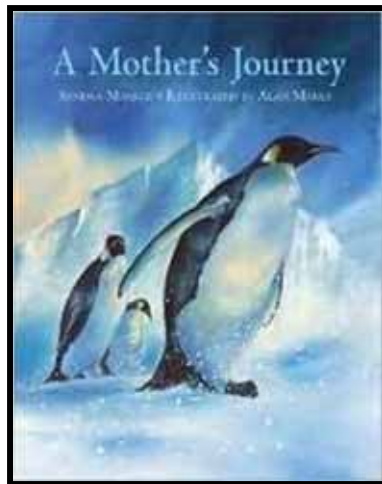




Let's pause for
questions from
the audience....

Bird study: Penguins

Titles from our virtual bookshelf.



Penguins units: SeaWorld
Education Department
Interdisciplinary units –
science, math, geography,
and language arts.

What's Happening to the Emperor
Penguins?

Students consider the impact of
the changing Antarctic
environment on Emperor Penguin
populations.



<http://nsdl.org>





http://www.penguinscience.com/education/royds_nestcheck.php



Runs from mid-October through January. Students follow Adelie penguin families as they raise their chicks at Cape Royds by logging in daily.

Students can create a fieldbook with weather conditions and nest status.

More Adelie activities at
<http://www.penguinscience.com/education/>



<http://nsdl.org>





Have you done CITIZEN SCIENCE?

A. Yes

B. No

C. I don't know!





Citizen Science:
Anyone can gather data!

Your Counts Really Matter!



[Arctic and Antarctic Birds - Issue 11, February 2009](#) [Across the Curriculum](#) [Lessons and Activities](#)



Project FeederWatch: Integrating Real-Time Science and Math

by Jessica Fries-Gaither

[Project FeederWatch](#) is a citizen science project operated by the Cornell Lab of Ornithology and Bird Studies Canada. Participants identify and count birds that visit feeders during the winter. Data is submitted to help scientists monitor bird populations across the North American continent.

In addition to involving students in real-time data collection, Project FeederWatch provides many possibilities for cross-curricular integrations. We've focused on math; many more content areas and suggestions appear on the [Project FeederWatch web site](#). A newly launched [Homeschooler's Guide](#) provides support for those participating outside a traditional classroom. Many of the activities in the guide could be modified for classroom use as well.

IDEAS FOR MATH INTEGRATION

Data Collection


Students are required to keep accurate records of bird counts as they participate in the project. Teachers can use this project to teach elements of data analysis, including the creation of data tables and use of tally marks.

Data Analysis


Teachers can also have students analyze their data by creating bar graphs showing the various species that visit the feeder, line graphs that show the number of visits over the course of a week, and so on. This is also a way to teach concepts such as mean, median, and mode (number of visits, species) with real-world data.

Ratios, Fractions, Decimals, Percents


Bird data could also be used to illustrate ratios, fractions, decimals, and percents. For example, a student might notice that out of four birds to visit the feeder on a given day, one was a cardinal. The student could then express that data as a ratio, fraction, decimal, and percent.



Project FeederWatch Homeschool Activities



Activity 2 Math Counts!



Step 1: Calculate seed consumption
Have your child weigh the birdseed in your feeder before and after each Project FeederWatch count—or every day for a week—and calculate how much seed was eaten or dropped. After several measurements, have your child determine the average consumption rate and predict how often the feeder needs to be refilled. Discuss the variables—weather, time of day, different seed, etc.—that may affect these predictions.



Step 2: Graph bird counts
Work with your child to create data tables about the kinds and numbers of birds that visit. Together, you can graph the results by hand or with a computer program such as Excel. Information about graphing and interpreting bird data can be found in the free ONLINE MIDDLE, *Birdwatch: Investigating Endemic*, specifically in Investigation 3, "Share me the Data." www.birds.cornell.edu/birdwatch/inquiry/resources

Feeder height vs. number of bird sightings

Notes: Daniel and Francesca had three bird feeders and wondered if the height at which a bird feeder was hung would affect the numbers of birds that visited each feeder. They watched their feeders for eight days, collected their data, and concluded that height had no effect.

Additional resource
Compare your observations with others in your area by exploring data submitted by Project FeederWatch in your state or province! Visit the Explore Data section of the FeederWatch web site: www.feederwatch.org.

Homeschooler's Guide to Project FeederWatch

Arctic and Antarctic Birds - Issue 11, February 2009 Professional Learning



The South Polar skua is the most southerly bird in the world. Although they live around the coastal edge of Antarctica, they have been seen flying over the South Pole, over 1,373 km (850 miles) from the coast. Photo courtesy of Arizona Owens, National Science Foundation.

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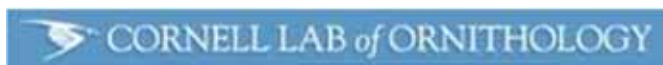
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