



Fantastic Feathers

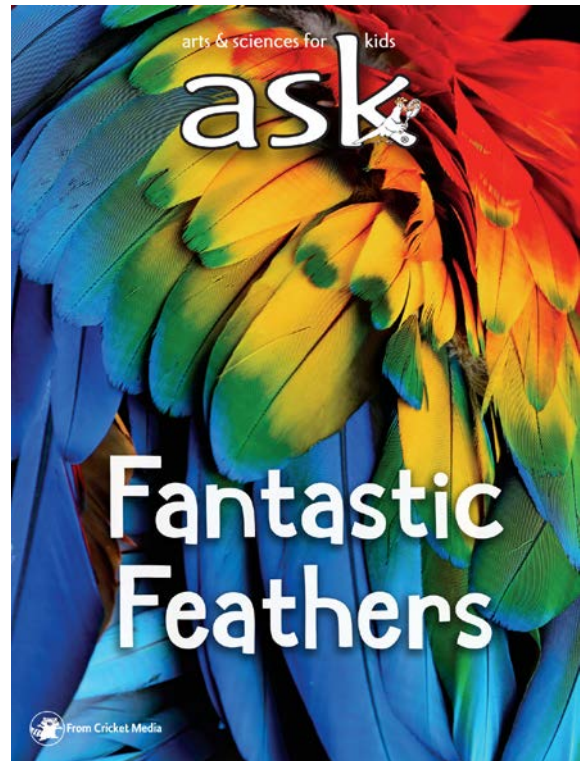
Feathers perform functions for birds beyond simply creating a beautiful aesthetic. A treat for virtually all of our senses, they are also an engineering masterpiece. Fly high with this issue of ASK to discover the many roles that feathers play in the life of a bird.

CONVERSATION QUESTION

How do the characteristics of feathers determine the role they play in the life of a bird?

TEACHING OBJECTIVES

- Students will learn how the manakin can sing with its wings
- Students will learn the science behind the color of feathers
- Students will learn about the silent flight of owls
- Students will obtain and organize information
- Students will collect evidence from text and graphics
- Students will evaluate and record information
- Students will conduct research and gather information
- Students will create a visual representation of information studied in the text
- Students will study and present a mini-research project



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **The Bird That Sings with Its Wings**
Expository Nonfiction, ~650L
- **Glamor Birds**
Expository Nonfiction, ~850L
- **Silent Flight**
Expository Nonfiction, ~650L

The Bird That Sings with Its Wings

pp. 10–11, Expository Nonfiction

Students will be delighted to learn that scientists have discovered a bird that can sing with its wings. Delve into this article to see how this amazing phenomenon occurs.



RESOURCES

- “Musical Manakins”

OBJECTIVES

- Students will learn how the manakin can sing with its wings
- Students will obtain and organize information
- Students will conduct research and gather information

KEY VOCABULARY

- **channeling** (p. 11) directing toward a particular end or object
- **crested** (p. 11) having a tuft of feathers, fur, or skin on the head
- **revealed** (p. 10) made known to others

ENGAGE

Conversation Question: How do the characteristics of feathers determine the role they play in the life of a bird?

Assign small groups and challenge the students to brainstorm ways that they can create sound with their bodies. Determine circumstances that various sounds might be utilized (e.g., clapping for applause). Motivate the students to read by revealing the article’s title and connecting it to this activity.

INTRODUCE VOCABULARY

Divide the class into groups of three. Assign each child in the group one of the three key vocabulary terms. Instruct them to locate and record a working definition of the word. They will each be responsible for teaching their word to the others in the group. Upon completion, students should have accurate definitions for all three words recorded in their notebooks.

READ & DISCUSS

Have the students remain with their partners from the vocabulary activity and read the article aloud within their group. Reconvene the class and use the following prompts to ensure a comprehensive understanding of the article.

- How were scientists able to discover that the manakin’s sound wasn’t coming from his beak?
- Describe the method by which the manakin uses its wings to produce sound.
- What is unique about the bones of the manakin?

CONCEPT/SKILL FOCUS: Obtain Information

INSTRUCT: Guide students to obtain information about the manakin. Explain that they will record details about the bird on the “*Musical Manakins*” organizer. They will also be responsible for writing a paragraph demonstrating their understanding of the method that manakins use to produce sound.

ASSESS: Have the students share their organizers in the small groups to compare findings. Collect the work to evaluate individual understanding.

EXTEND

Language Arts Elicit from the students that there are other animals and insects that produce sounds in unusual ways. Review the examples given in the text (i.e., crickets, rattlesnakes). Have the students research other examples in the animal kingdom. Instruct the students to write and illustrate a short informational text on chosen animal or insect and share with the class. Bind these research pages into a class book.

Musical Manakins

Habitat:

Diet:

Appearance:

Feathers	Bones

Explain: *Method of producing sound:*

Glamor Birds

pp. 12–15, Expository Nonfiction

Students can soar on the wings of a bird into a beautiful world of color. Learn the science behind all the colors of the rainbow that are represented in the avian species.



RESOURCES

- “Color My World”

OBJECTIVES

- Students will learn the science behind the color of feathers
- Students will collect evidence from text and graphics
- Students will create a visual representation of information studied in the text

KEY VOCABULARY

- **absorbed** (p. 15) soaked up
- **cunning** (p. 13) sly, clever
- **prism** (p. 14) a transparent object that separates white light into different colors
- **reflective** (p. 15) capable of sending back light without absorbing it

ENGAGE

Conversation Question: How do the characteristics of feathers determine the role they play in the life of a bird?

Distribute white drawing paper to the class and provide them with an array of colors using any medium of your choosing (e.g., crayons, colored pencils, markers, paint). Instruct them to create the most “attractive” bird they can imagine. Upon completion invite the students to roam the room to view the work of their peers. Discuss what colors and details seemed prevalent, as well as the colors that were used sparingly.

INTRODUCE VOCABULARY

Activate prior learning by listing the four vocabulary words on the board. Have students read each word and think about other words that come to mind when they see that word. Record their connections on the board and discuss. At the end of this activity, post and discuss the definitions provided in this guide.

READ & DISCUSS

Have students study the graphics and read the article. Use the following prompts to discuss the science behind beautifully colored feathers.

- Explain the statement “Feathers aren’t just for flying.”
- What are the three main ways that feathers get their colors?
- How do melanins affect the color of a bird’s feathers?
- How do reflective layers affect the color of a bird’s feathers?

CONCEPT/SKILL FOCUS: Collecting Evidence

INSTRUCT: Guide students to obtain information from the text, captions, and photos in the article. Introduce the “Color My World” graphic organizer and instruct students to record their findings.


ASSESS: Review the information the students recorded on their charts. If any errors are noted, redirect the students to return to the text and make corrections.

EXTEND

Art in Science Hand students back their “Color My World” activity sheets. Advise the class that they may use information from the article or research their own examples to create a tri-fold visual aid that illustrates the three ways color is obtained in the animal kingdom.

Color My World

Use information from the article “Glamour Birds” to complete the chart. How do birds get their spectacular colors?

Color Sample	Bird Name	Natural Pigments/Skin	Pigments in Food	Prisms Reflective
pink 	flamingo		X	
blue				
black				
red				
brown				
orange				
purple				
yellow				
green				

Silent Flight

pp. 26–27, Expository Nonfiction

Glide into this article with students and discover the beauty and strength of the silent, unflappable owl. Teach students about the unique characteristics of this “sneaky” bird.



RESOURCES

- “WHOOO Can Find This Information?”

OBJECTIVES

- Students will learn about the silent flight of owls
- Students will evaluate and record information.
- Students will study and present a mini-research project

KEY VOCABULARY

- **burrow** (p. 26) hole/tunnel dug by a small animal
- **dampens** (p. 27) makes less intense
- **ragged** (p. 27) having a rough, uneven edge
- **surface** (p. 26) outside part or uppermost layer

ENGAGE

Conversation Question: How do the characteristics of feathers determine the role they play in the life of a bird?

Have students stand up and imitate birds. List the actions you see and sounds you hear on the board. Ask the students to help you amend this list. Introduce the article and ask the students to note any changes they will make in their imitations after reading the article. Repeat the activity after reading “Silent Flight.”

INTRODUCE VOCABULARY

Have students locate the sentences in the article that contain the key vocabulary words. Elicit meanings from the students, then post the definitions on the board. Instruct the children to make illustrations (nonlinguistic) depicting the meanings of the words.

READ & DISCUSS

Have students read the article with a partner. Instruct them to consider the question in the subtitle, “What makes owls so sneaky?” Use the following questions to prompt high-level thinking.

- Why is it necessary for owls to fly silently?
- Why do most birds flap, while owls glide?
- What results did bird scientists uncover concerning owl wings?
- How are engineers planning to use this information?

CONCEPT/SKILL FOCUS: Evaluate Information

INSTRUCT: Explain that this article contains information to help the reader learn about the silent flight of owls. Distribute copies of the “WHOOO Can Find This Information?” graphic organizer. Instruct the class to search for relevant details and complete each section.

ASSESS: Use the graphic organizer to assess if students recorded accurate information in each of the sections.

EXTEND

Social Studies Throughout history scientists and engineers have studied nature to assist them in designing more efficient machinery (wind turbines, airplanes, etc.). Assign students the task of locating and learning about one specific example of a machine that was based in some way on the characteristics of animals or insects. Then, invite them to share their findings with the class.

WHOOO Can Find This Information?

