The Mystery of Migration

By Emily Morgan and Karen Ansberry

The migration patterns of animals have long been a source of wonder and awe. From the 6-mile journey of the army ants in the rain forests of Costa Rica, to the 20,000-mile journey of the sperm whale through the world's oceans, we are fascinated by these animals' ability to recognize when it's time to leave and where to go. The lessons in this month's column explore what we know about animal migration and what still remains a mystery.

This Month's Trade Books

Going Home: The Mystery of Animal Migration

Written by Marianne Berkes.
Illustrated by Jennifer DiRubbio.
Dawn Publications. 2010.
ISBN 978-1-58469-1273.
Grades K–4

Synopsis

This beautifully illustrated book uses rhyming verse to tell of the migration of 10 different animals. Insets and end matter contain specific information about the animals and what is known about their migration patterns.

Great Migrations
Written by Elizabeth Carney.
National Geographic. 2010.
ISBN 978-1-4263-0700-3.
Grades 5–6

Synopsis

Based on the National Geographic Channel's special *Great Migrations,* this book features eight very different animals with one thing in common, they migrate.

Curricular Connections

The *National Science Education Standards* suggest that in grades K–4, students should learn that an animal's patterns of behavior are related to that animal's environment and that when the environment changes, some animals stay and survive, some die, and some migrate. In the K–4 lesson, students learn through a read-aloud about 10 different animals that migrate, map their migration routes, and discuss reasons for migration. It is important for students to know that not all animals migrate, that there are other ways animals deal with changes in the environment. So in this lesson, students research how local animals respond to the changing seasons. Students in grades 5–8 go more in depth into the study of behavioral adaptations by addressing migration as a response to internal or environmental stimuli. In the lesson for grades 5–6, groups of students choose an animal from *Great Migrations*, research the migration patterns of that animal, share their findings, and discuss the internal cues and external cues that animals use to determine when it is time to migrate. Then, students join with another group to create a Venn diagram comparing and contrasting two migrating species. Both lessons end with a discussion of what is known about migration and what still remains a mystery.

Karen Ansberry (karen@pictureperfectscience.com) *is a science curriculum leader at Mason City Schools in Mason, Ohio. Emily Morgan* (emily@pictureperfectscience.com) *is a consultant for Picture-Perfect Science in West Chester, Ohio. They are the authors of* Picture-Perfect Science Lessons *and* More Picture-Perfect Science Lessons, *available from NSTA Press.*

Grades K–4: Going Home

Engage

Before class, print out several sets of bookmarks with pictures of the 10 animals featured in *Going Home: The Mystery of Animal Migration,* available on the Dawn Publications website (see Internet Resources). Give each group of 3–4 students a set of bookmarks. Show students the cover of *Going Home* and read the first page aloud. Tell them that as you read the rest of the book, you are not going to show them the pictures because you would like them to infer from the text which animal you are reading about. After reading the left-hand page for each animal, ask students to hold up the bookmark with the picture of the animal they think you are reading about. Then, read the right-hand side of the page about that animal and show them the picture.

Explore

Provide each pair of students with a simple world map and several markers or colored pencils. Read the section in the back of *Going Home* titled, "Find Their Route" which describes the migration route of each of the animals featured in the book. Have students find the route of one of the animals described in the reading and show the migration path that animal takes by drawing a double arrow in one color. Repeat for each of the animals using a different-color arrow, and then have them create a key that shows what each color of arrow represents. For younger students, you may want to do this together on the overhead. When they have all the animals' migration paths on the maps, have a discussion about how the routes compare, which is the longest, or the shortest.

Explain

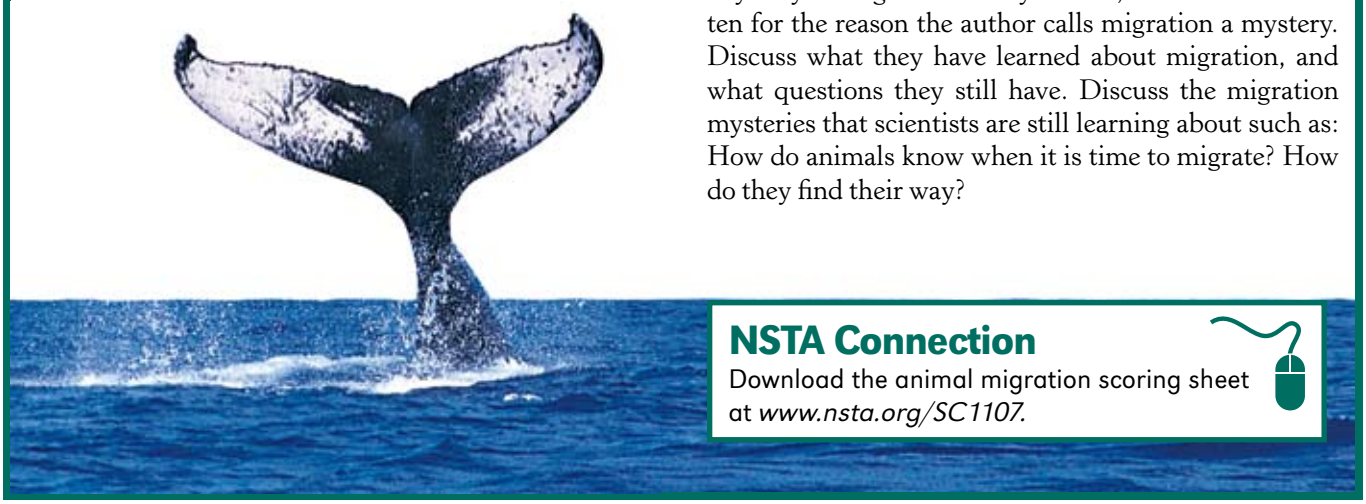
Read the section in the back of *Going Home* titled, "About the Migrating Animals," and ask the students to listen for the reasons that each animal migrates. Then, have groups of students sort the animal bookmarks by the reason for migrating (e.g., finding food, laying eggs, finding warmer temperatures). Ask, "Do any fit in more than one category?" Students will realize that some animals, like the manatees, migrate to be in warmer water and to find more food. Next, have them sort their animal bookmarks into groups based on how they travel (e.g., fly, swim, walk). Last, students can create some of their own categories for sorting the animals.

Elaborate

Ask students whether any of the animals featured in *Going Home* live any part of their lives in your area. Research the animals in your area that migrate. Your state Department of Natural Resources website might be a good place to start. It is important that students understand that not all animals migrate—some hibernate, become dormant, or have adaptations that allow them to continue to live in the same place during the changing seasons. Print out pictures of some of your local animals and have students sort them into two categories: Migrates or Does Not Migrate. Map the migrations of some local animals and discuss why they migrate.

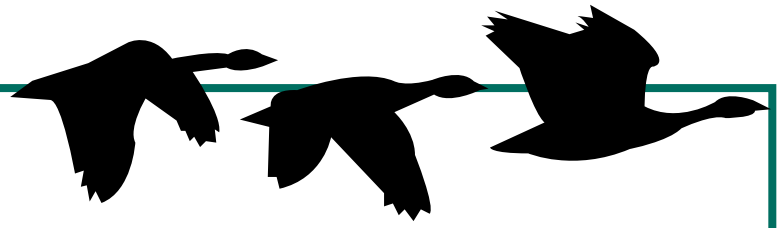
Evaluate

Read the section in the back of the book titled, "The Mystery of Migration." As you read, ask students to listen for the reason the author calls migration a mystery. Discuss what they have learned about migration, and what questions they still have. Discuss the migration mysteries that scientists are still learning about such as: How do animals know when it is time to migrate? How do they find their way?



NSTA Connection

Download the animal migration scoring sheet at *www.nsta.org/SC1107.*



Grades 5–6: Great Migrations

Engage

Make a list on the board of the following animals: Mali elephants, red crabs, monarch butterflies, jellyfish, zebras, army ants, wildebeests, and sperm whales. Then ask students what the animals might have in common. Post photos of these animals where all can see, and allow students time to turn and talk to a partner about their ideas. Have students share their ideas with the whole class, then show them the cover of *Great Migrations*. Tell them that all of those animals migrate, or make a regular journey from one place to another. Then read aloud pages 10 and 11 about *Great Migrations,* which this book is based on. Tell students that they are going to work in groups to become experts about the migration of one of the animals in the book. Read each two-page photo spread aloud, skipping the informational pages in between. You may want to leave out the name of each animal as you read and have students infer which animal is being described. After you read, have each student write his or her name and top three animal choices on a slip of paper. Use these to form research groups.

Explore

Provide each group with the animal migration scoring sheet (see NSTA Connection) and a copy of *Great Migrations* (or a laminated two-page spread of their animal). Tell them that they will be collecting a variety of information about their animal to share on a poster, but the big question they should be thinking about is "How Do They Know When to Go?" They should use the book as well as the National Geographic Great Migrations website, which contains amazing videos and additional information about animal migrations (see Internet Resources).

Explain

Have students display their posters around the classroom or in the hallway. Set up a "gallery walk" in which they circulate around the room to view the posters. Have each student write a comment and a question on a sticky note and place it on each poster. After the gallery walk, the poster groups can answer some of the questions they received. Tell students that one of the mysteries of animal migration is how the animals know when it is time to migrate. Create a t-chart labeled "External Migration Cues" in the first column and "Internal Migration Cues" in the second column. With the class, make a list of external cues that tell animals when to migrate (e.g., amount of sunlight, changing seasons, and food or water availability). Then make a list of internal cues (e.g., fat reserves, hunger, thirst, or hormonal changes). Ask students whether the animal they researched uses internal cues or external cues or both. They will find that many animals use both.

Elaborate

Next, have each group of students combine with another group to create a large Venn diagram that compares and contrasts the animals each group has been researching. This will give each group a chance to teach some of what they have learned and compare their animal's migration pattern to other animals. Post these Venn diagrams in the room.

Evaluate

Assess student learning on their posters and Venn diagrams. Last, discuss the idea that many aspects of migration remain a mystery to scientists. Ask students what they are still wondering about migration. Have each student jot down a question they have, then have each group choose the most compelling question at their table to discuss.

Internet Resources

Educator Resources

www.nationalgeographic.com/great-migrations-educator-resources

Going Home Animal Bookmarks

http://dawnpub.com/activities/GoingHomeBookmarks.pdf

Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Content Standards

Standard C: Life Science

Grades K–4

- Organisms and their environments

Grades 5–8

- Regulation and behavior

National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academies Press.