



# Mysteries of Migration

Atlanta Audubon Society's Learning About Birds Curriculum Series

## EDUCATOR'S GUIDE

**Grade Levels**  
3 - 5

### Objective

Students will explore the reasons, means, and hazards of seasonal migration through interactive science, math, and geography activities.

### Background

The long distance movements of birds have awed humans for centuries. Migration signals a change of seasons and a change in the interactions between plants and wildlife. They are especially exciting periods of time for people to catch a glimpse of species that do not normally live in their environment.

Almost 350 species of birds in North America are migratory. Each journey differs by species, and even sometimes by populations within a species. The exact science as to how species get from point A to point B is still unknown. Two things we do know are that migration takes a lot of energy and is a very hazardous behavior. Even birds that do not take these long journeys face many of the same challenges that migratory birds encounter. Humans create many of these obstacles including habitat loss, communication towers, tall buildings, chemical pollution, and domestic cat predation. It is estimated that almost half of the birds that set out on a migratory journey do not make it. Scientists have evidence that the human element is a large contributor to these losses. As we learn more and spread our knowledge, people will be able to take action to help migratory birds have a successful journey.

### Vocabulary

**Breeding Ground** - The seasonal habitat where a bird finds a mate, builds a nest, and raises young.

**Citizen Scientist** - A non-scientist who participates in collecting scientific data for conservation purposes.

**Fledgling** - A young bird that is ready to fly.

**Migration** - The movement of animals from one location to another, usually due to changes in the seasons.

**Ornithologist** - A scientist who studies birds.

**Wintering Ground** - The habitat where a bird spends the non-breeding season.

### Content and Skills aligned to Georgia Performance Standards

*Science* - S3L1c,d; S3L2a,b; S4E2a,c; S4L1c,d;S4L2a.

*Geography* – reviews political boundaries in the Americas

*Calculations* – S3CS2a,b,c; S4CS2a,b,c; S5CS2a,b,c.

*Systems & Models* – S3CS4b;S4CS4b; S5CS4b.

*Communication* - S3CS1b; S3CS5c,d; S3CS6a; S3CS8a,b,c;

S4CS1b,c; S4CS5c,d; S4CS6a; S4CS8a,b,c; S5CS1b,c; S5CS5c,d;

S5CS6a; S5CS8a,b,c.

### Activity 1 – Review Earth’s Movements

**Essential Question:** How does the movement of Earth affect birds?

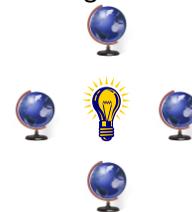
**Suggested Time:** 15-20 minutes

**Space:** An area indoors for students to sit in a circle.

**Materials:** 4 globes, light bulb, lamp without shade or lantern, extension cord, marker board/easel pad.

#### Instructional Methods

1. Before starting this activity, set up a model of the Earth in each of its seasonal positions around the Sun. Place the light (Sun) in the middle of the area where students will sit and distribute the globes evenly around the light, far enough away so that students can form a circle behind them. Make sure that each globe stands tilted the same direction (bearings facing the same way). The globe with the tilt towards the light (bearings on the “sun” side) represents summer in the Northern Hemisphere. The Earth revolves counter-clockwise (if viewing our solar system from above) therefore the globe to left of summer represents fall. Test your set up by turning on the light and darkening the overhead lights. Do not label the globes.



## Activity 1 – Review Earth’s Movements continued

2. Explain that living things are adapted to planetary conditions. Organisms have different strategies to avoid competition with other organisms to survive. Many birds use the strategy of migration to meet their needs for survival. Ask the group what migration is. (Migration is the movement of animals from one location to another, usually due to changes in the seasons.)
3. Ask the group why they think birds migrate. Tell them that you will help them to answer this question by demonstrating the Earth’s movements.
4. Ask for a volunteer. Place this person somewhere around the light representing the Sun. Ask the group how the Earth moves. Earth rotates counter-clockwise on its imaginary axis every 24 hours, or a day. Ask the student to demonstrate this with his/her body. Earth also revolves, or orbits, the sun at the same time, completing a full orbit every 365 days, or a year. Ask the student to demonstrate both the rotational and revolutionary movements at the same time. Make sure the student does not trip. Note to the class that Earth is tilted at a 23.5 degree angle, and this tilt does not change.
5. Invite students to sit in a circle behind the globes. Turn on the light and darken the overhead lights. Explain that this model represents the Earth in each of its seasonal positions. Ask the group to point to the globe which they believe is summer in the Northern Hemisphere. (Review the hemispheres if necessary). Ask for students to raise their hands and explain why they chose a particular globe.
6. Have students deduce which globes represent which seasons. Have the student sitting behind each globe take turns spinning them counter-clockwise, demonstrating the amount of daylight.
7. Wrap up by asking the group again why birds migrate. (The amount of daylight affects the amount and types of food available, the amount of available water, and the weather conditions in a bird’s habitat. If there are better options for a bird somewhere else, it can fly to another habitat.)
8. Some students may not grasp this concept – it is hard! If you sense more exploration is needed, walk the students through an animation of the Earth’s orbit around the Sun. An Internet search for “model of Earth’s seasons” will bring up several options.

## Activity 2 – Flapping Frenzy

**Essential Question:** What does it feel like to migrate?

**Suggested Time:** 20-30 minutes

**Space:** Open area for students to move freely.

**Materials:** Marker board/easel pad, bird field guide, Flapping Frenzy cue cards (page 5), enough toothpicks or other game pieces for each student to have 3.

### Instructional Methods

1. Before the activity, copy 1 each of the cue cards.
2. Explain that migration is an energy-expensive behavior. Ask the group how birds decide when to migrate. After hearing some ideas, write the migration equation on the board/easel (Migration= Amount of Daylight + Weather + Just Knowing). Explain that different species of birds migrate at different times, and when it is time go, they have to go in order to increase their chance of survival.
3. Gather the group in a horseshoe. Tell them that they will demonstrate what it is like to migrate. Have the group count off by 3’s. Assign each number a species of bird: Peregrine Falcon, Green Heron, and Ruby-throated Hummingbird.
4. Show the group a picture of each migratory bird in a field guide. Quickly talk about the habits of each:
  - Green Herons are short, stocky wetland birds that hunt along freshwater shores. They flap their wings ~120 times per minute.
  - Peregrine Falcons are the fastest flyers and can dive for prey at almost 200 mph. Notice the “fighter plane” body shape. They flap their wings about ~240 times per minute.
  - Ruby-throated Hummingbirds weigh less than a penny and complete a 1,500-2,000 mile migration. They flap their wings about ~4,200 times per minute (~70 flaps/second).
5. Explain that each group of birds will simulate migration for that species. Spread the game pieces in the middle of the horseshoe. Tell students that they are to listen and look for your cues to flap, grab food and water, and rest.
  - Students should start in the rest position (sitting or squatting).
  - Say one of the bird names and raise the “FLAP” cue card. Students representing that bird should stand and flap (you can emphasize the number of flaps per minute for fun).



# Mysteries of Migration

Atlanta Audubon Society's Learning About Birds Curriculum Series

## EDUCATOR'S GUIDE

### Activity 2 – Flapping Frenzy continued

- Get all three bird species flapping before you give different cues.
- Students should continue to do what they were last instructed to do until their bird name is called again.
- Say one of the bird names and raise the “FOOD & WATER” cue card. Students should grab a game piece, take it back to their spot, and pretend to eat.
- Say one of the bird names and raise the “REST” cue card. Students representing that bird should sit and rest.

Mix it up and have fun with it. The idea is to show that birds must stay alert even though migration is tiring. This will challenge students' coordination and thinking-on-the-fly skills.

6. After several minutes, end the demonstration by announcing that all of the birds completed their migration. Ask the group how they feel. Did anyone stop flapping? What would happen to a bird that just stopped flapping if it was tired?
7. *Optional:* Give your students a rest. Begin reading a book about birds' migration experiences such as:
  - Peregrine's Journey: A Story of Migration, M. Dunphy
  - Winged Migration (Jr. Ed), S. Durand and G. Poyet
  - Luck: The Story of a Sandhill Crane, J. George
  - Late Little Robin, H. Goldsmith
  - On the Wing: American Birds in Migration, C. Lerner
  - Black Sky River, T. Seymour
  - Red Knot: A Shorebird's Incredible Journey, N. Willis

### Activity 3 – Migration Mapping

**Essential Question:** Where do migratory birds go?

**Suggested Time:** 30-45 minutes

**Space:** Area with a bulletin or magnetic board, or easel.

**Materials:** A bulletin board with tacks/map pins for each student, magnetic board with a magnet per student, or easel with dry erase markers, Migration cards (pages 6-7), large map of the Americas, 6 colors of yarn/string, scissors, field guide, *Mysteries of Migration* student activity guide, tape, copies of small map (page 8).

### Activity 3 – Migration Mapping continued

#### Instructional Methods

1. Before conducting the activity, copy and cut out Migration cards. Post the large map on your bulletin board, magnetic board, or easel. You may want to laminate it. Cut 5 lengths of each color of yarn/string long enough to reach from across the continents.
2. Begin the activity asking the group about the longest trips they have taken. Tell the students to imagine flying that distance instead of taking an automobile, train, boat, or airplane.
3. Review the map of the Americas with the group. Ask the group to identify your location and several other landmarks in North, Central, and South America. Ask if any students have family in a different country than your own and point out those areas.
4. Explain that as a group, you will map the migratory path of an Indigo Bunting, Ruby-throated Hummingbird, Summer Tanager, Cedar Waxwing, Yellow-rumped Warbler, and Wood Thrush. Show pictures of each in a field guide. Ask the group how they think people know where migratory birds' breeding and wintering grounds are. (Define these terms if necessary.) Ornithologists gather information through bird counts, bird banding, and nest monitoring. (Descriptions of these are in the *Mysteries of Migration* student activity guide.)
5. Create a key to the bird species on the large map as a group, assigning a color yarn/string to each bird. Write the name of the color or affix a small piece of yarn on the map and write the name of the bird (use a dry erase marker for laminated maps).
6. Shuffle the Migration cards and pass one out to each student. Explain that each card reveals part of a journey for one species of bird. Students will take turns reading their cards aloud, then marking that spot with a pin/magnet/dry erase marker and tying/placing/taping the correct color of yarn/string to the location. The yarn/string can be left hanging for the next student to connect the locations. Map one species at a time. The end product will be a physical map of different migratory paths.
7. Wrap up by identifying the longest and shortest journeys. What challenges might these birds face?

## Activity 4 – Migration Hurdles

**Essential Question:** What challenges do migratory birds face on their journeys?

**Suggested Time:** 20-30 minutes

**Space:** You may play this indoors or outdoors.

**Materials:** Set of Migration Hurdle bird cards and leader cards (pages 9-11), coffee can, hat, or cloth bag.

### Instructional Methods

1. Before the activity, make a copy of the Migration Hurdle bird cards and leader cards. You may consider making a permanent deck by laminating the cards mounted on colored construction paper that matches their card.
2. Begin by asking students to describe a hurdle. Explain that birds experience many “hurdles” or physical challenges along their migratory journeys. Ask the group to brainstorm some possible hurdles a bird may encounter (predators, tall structures, windows, polluted food or water, loss of habitat, or weather events).
3. Out of a population, or group of the same species of birds, many do not make it to their destination. Show the group the Migration Hurdle bird cards and explain that each student will pick one randomly out of the coffee can/hat/bag and stand up. The group represents a population of migratory birds. Ask the students to suggest a species.
4. Once everyone has a card, place your leader cards into the coffee can/hat/bag. Explain that each card tells the fate of each bird in the population and you will pick them out one by one to find out what events occurred during this migration. Pick a card and read the color and message aloud. Students with that color should follow your instructions.
5. Once all of the leader cards have been pulled, explain that the students still standing represent the individuals that survived the migration. Figure out what percentage of the population survived by dividing the number of survivors by the original population number and moving the decimal point. You may do this as a group or individually.
6. Wrap up by discussing the challenges of migration. What surprised the students about the outcome? What could people do to help birds be more successful?

## Extension Ideas

- Students can write a migratory bird biography of a species of their choice, highlighting the bird’s seasonal movements and migration hurdles.
- Extend Activity 3 by assigning small groups to estimate the length of the six different bird journeys. Provide them with copies of the small maps to help them figure it out.
- What is life like for birds at their “second home”? Investigate bird habitats in other countries.
- In small teams, have students invent a game about migration hurdles. Provide them with copies of the Migration Hurdle cards (uncut) and supplies. Teams can show the group how to play their game. Make the games available for free play or for students to borrow and play at home with others.
- Invite an ornithologist to visit your group. What do they do specifically that forwards our knowledge of bird migration? (Georgia residents can contact Atlanta Audubon Society for a presentation.)

## Performance Tasks and Assessment

- Using the copies of the small map provided on page 8, assign students to research and map the migration route of a bird of their choice. Have students choose a bird from your local bird checklist – this will indicate whether it is migratory or a resident of your area. Students should create a key and a short paragraph to narrate the journey, highlighting any hurdles along the way.
- Assign students to develop a list of migration hurdles in their neighborhood or at your facility. Students should be prepared to explain why the items on their lists are hurdles. Compare results as a group on the Migration Hurdle Results Chart on page 12.
- Using the data from the Migration Hurdle Results Chart in the task above, ask students to write a short essay on how humans can lessen the negative impact on bird migration. Have students use vocabulary from their student activity guide.

## Additional Resources

Council for Environmental Education. 2004. [Flying Wild Educator’s Guide to Celebrating Birds](#). CEE. Houston, TX.



For more information on Atlanta Audubon Society's Learning About Birds curriculum series, please visit the Atlanta Audubon Society website at [www.atlantaaudubon.org](http://www.atlantaaudubon.org)

Copyright 2011 Atlanta Audubon Society. This publication was made possible by Together Green and Atlanta Audubon Society staff and volunteers.

Activity 2: Flapping Frenzy Cue Cards

**FLAP**

**FOOD &  
WATER**

**REST**

**Activity 3: Migration Mapping**

<b>A SUMMER TANAGER was first seen nesting in North Carolina in July.</b>	<b>The INDIGO BUNTING was seen in Argentina in December.</b>
<b>The SUMMER TANAGER was seen in southern Peru in November.</b>	<b>The INDIGO BUNTING was seen in Panama in January.</b>
<b>The SUMMER TANAGER was seen in Ecuador in October.</b>	<b>A CEDAR WAXWING was banded in Alabama in January.</b>
<b>The SUMMER TANAGER was seen in Costa Rica.</b>	<b>The CEDAR WAXWING was seen in Minnesota in April.</b>
<b>The SUMMER TANAGER was seen in Florida in April.</b>	<b>The CEDAR WAXWING was seen nesting in Ontario in July.</b>
<b>An INDIGO BUNTING was banded in Louisiana in June.</b>	<b>The CEDAR WAXWING was recaptured at a banding station in Tennessee in October.</b>
<b>The INDIGO BUNTING was seen nesting in Wisconsin in early July.</b>	<b>The CEDAR WAXWING was seen in Alabama in November.</b>
<b>The INDIGO BUNTING was seen in Georgia in September.</b>	<b>A RUBY-THROATED HUMMINGBIRD was seen in Maine in July.</b>

### Activity 3: Migration Mapping

<p><b>The RUBY-THROATED HUMMINGBIRD was seen in Virginia in August.</b></p>	<p><b>The YELLOW-RUMPED WARBLER was recaptured at a banding station in Mexico in September.</b></p>
<p><b>The RUBY-THROATED HUMMINGBIRD was seen in Cuba in September.</b></p>	<p><b>The YELLOW-RUMPED WARBLER was seen in Guatemala in November.</b></p>
<p><b>The RUBY-THROATED HUMMINGBIRD was seen in eastern Mexico in December.</b></p>	<p><b>A WOOD THRUSH was seen nesting in Michigan in May.</b></p>
<p><b>The RUBY-THROATED HUMMINGBIRD was seen in Rhode Island in June.</b></p>	<p><b>The WOOD THRUSH was banded in Kentucky in September.</b></p>
<p><b>A YELLOW-RUMPED WARBLER was banded in Texas in January.</b></p>	<p><b>The WOOD THRUSH was seen in Georgia in October.</b></p>
<p><b>The YELLOW-RUMPED WARBLER was seen nesting in Colorado in June.</b></p>	<p><b>The WOOD THRUSH was recaptured at a banding station in Colombia in December.</b></p>
<p><b>The YELLOW-RUMPED WARBLER was seen in New Mexico in August.</b></p>	<p><b>The WOOD THRUSH was seen in Ohio in April.</b></p>

# The Americas



**LEGEND**

— National boundary

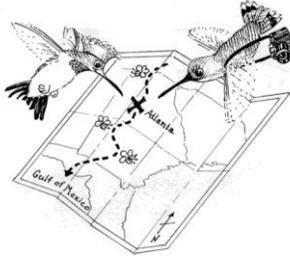
0 500 1000 miles

0 500 1000 kilometers



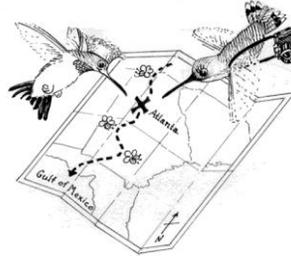
# Activity 4: Migration Hurdles Bird Cards

**GREEN**



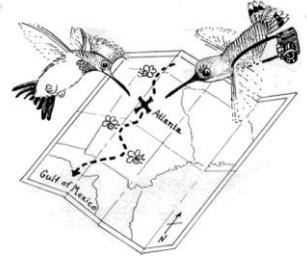
A. McCallum

**GREEN**



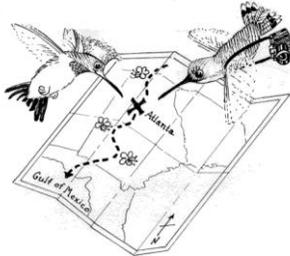
A. McCallum

**GREEN**



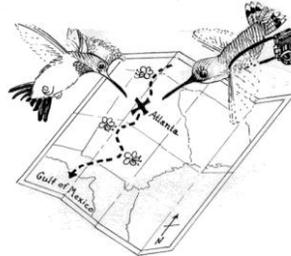
A. McCallum

**GREEN**



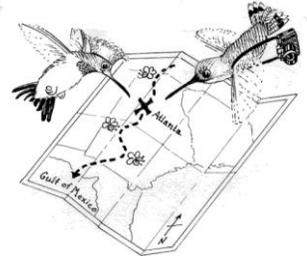
A. McCallum

**GREEN**



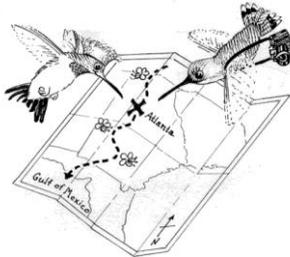
A. McCallum

**GREEN**



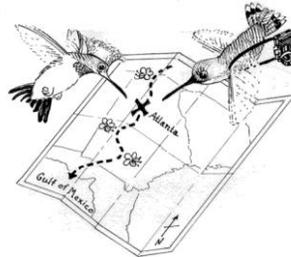
A. McCallum

**GREEN**



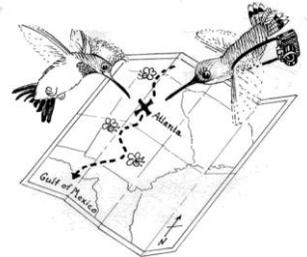
A. McCallum

**GREEN**



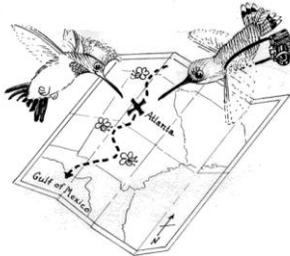
A. McCallum

**GREEN**



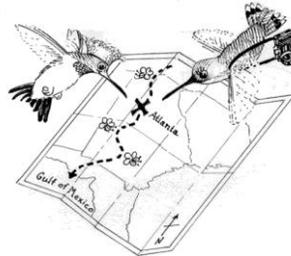
A. McCallum

**GREEN**



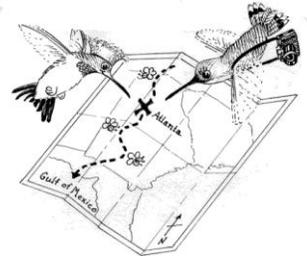
A. McCallum

**GREEN**



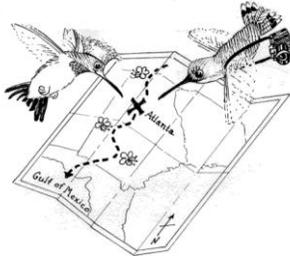
A. McCallum

**GREEN**



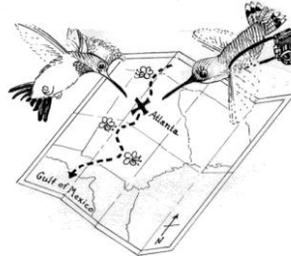
A. McCallum

**GREEN**



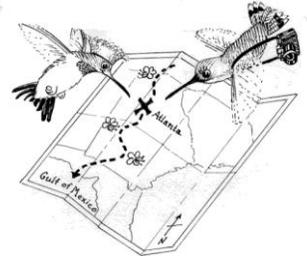
A. McCallum

**GREEN**



A. McCallum

**GREEN**



A. McCallum

Activity 4: Migration Hurdle Leader Cards

<p><b>RED</b></p> <p><b>Predator Alert!</b>  <b>You were just eaten by a Red-tailed Hawk.</b>  <b>You are out!</b></p>	<p><b>ORANGE</b></p> <p><b>Meow! A pet cat caught you while you were resting.</b>  <b>You are out!</b></p>	<p><b>YELLOW</b></p> <p><b>Bonk! You fly into a window and get confused.</b>  <b>You are out!</b></p>
<p><b>PINK</b></p> <p><b>Oh no! Your usual rest stop was turned into office buildings.</b>  <b>You are out!</b></p>	<p><b>LIGHT BLUE</b></p> <p><b>Slurp! You eat and drink from a polluted marsh and are poisoned.</b>  <b>You are out!</b></p>	<p><b>DARK BLUE</b></p> <p><b>Storm alert! You were blown off course and lost at sea.</b>  <b>You are out!</b></p>
<p><b>BLACK</b></p> <p><b>Smack! You hit a cell phone tower in the middle of the night.</b>  <b>You are out!</b></p>	<p><b>BROWN</b></p> <p><b>You land in a wildlife refuge - take a break. (Sit down and relax for 10 seconds)</b></p>	<p><b>BROWN</b></p> <p><b>You land in a backyard with lots of full feeders. (Rub your tummy)</b></p>
<p><b>BROWN</b></p> <p><b>Whoosh! The wind is pushing you in the right direction. (Stop flapping and soar.)</b></p>	<p><b>WHITE</b></p> <p><b>Watch out! Windmills ahead. (Angle your "wings" to fly around them.)</b></p>	<p><b>WHITE</b></p> <p><b>Slow down! Power lines ahead. (Flap in slow motion)</b></p>

**Activity 4: Migration Hurdles Results Chart**

	<b>Migration Hurdle</b>	<b>Number</b>	<b>Notes (Why is it a hurdle?)</b>
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			