



RAINFOREST
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Neotropical Birds & Migration

Levels: Ages 15 – 18



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Standards

- Common Core Standards for English Language Arts/Literacy and Mathematics
- Next Generation Science Standards for HS Interdependent Relationships in Ecosystems

Concepts

- Students learn about the incredible natural history of Neotropical birds that migrate between breeding grounds in the temperate forests of North America and feeding grounds in the tropical forests of Central and South America.
- What are the benefits of having two homes and what ways are Neotropical migrants and their habitats in both places affected by what we do here?

Part I: Making Connections

Idea – Of the hundreds of different bird species found throughout North America, over 340 species are Neotropical migrants that breed in the United States and Canada and winter in Latin America and the Caribbean. Many birds we marvel over at our birdfeeders or whose songs fill the spring forests are summer visitors from the tropics. Species of warblers, sparrows, plovers, terns, hawks and cranes all follow the seasons living an endless summer. Of the over 300 species of Neotropical migrant species, over 120 are in decline, some severely. These birds face a gauntlet of dangers on their migration routes while their habitats in both places are shrinking and increasingly fragmented.

Students will learn about the secret lives of some of the most common and ubiquitous birds in their own backyards who live a double life in the tropics. In addition, students will examine how protection of habitat here in North America for these species doesn't necessarily translate into protection for the species if their habitats are threatened in the tropics. Through the lens of the shade grown coffee system students will understand the relationship between local and global processes affecting migrant birds.

Materials – Access to the internet to visit Cornell Ornithology Lab's *All about Birds Page*.

Procedure –

1. Give a short lecture to the class on migratory birds. Discuss reasons why some birds migrate (food, climate, shelter and the ability to take advantage of seasonal abundance).
2. Visit Cornell Ornithology Labs *All about Birds Page* to visit their Bird Guide <http://www.allaboutbirds.org/guide/search>.
3. Many songbirds in the Warbler family are Neotropical migrants breeding in North America in the summer and overwintering in Latin America and the Caribbean. Have students use the Bird Guide to research the Warblers by searching "Name and Shape" or use the search engine.
4. Have students browse through the many species of Warblers and research which ones live in their area and migrate to the tropics every winter. After some research, have each student pick a different Neotropical warbler species to research more fully.
5. Each student should research the following aspects of their bird species natural history: winter and summer range, migration arrival and departure times, migration distances and duration, bird calls, plumage, preferred habitat, behavior, nesting and food resources.
6. Ask students: 1. Why can some species of birds like cardinals and chickadees live in cold, winter temperatures while others like warblers fly thousands of miles to live in warm, tropical rainforests for the winter? 2. Why do birds living in warm, tropical rainforest with enough shelter, food and resources leave their home to risk the dangers of flying thousands of miles to the north to raise their chicks, only to fly back again 6 months later?
7. Have students develop a hypothesis (a proposed explanation for phenomena) for how some birds benefit from migrating to other areas despite the dangers. Then explain how migrating between two areas allows some birds to take advantage of seasonal abundances of insects and food resources in time with their nesting to feed chicks. More information here: <http://www.birds.cornell.edu/AllAboutBirds/studying/migration/>

8. Lastly, think of some ways migrating birds might help both temperate and tropical rainforest ecosystems? List benefits to birds in each ecosystem, then list benefits to the ecosystem from birds.

Part II: Reading and Discussion

Idea – Have students discuss the epic journey that Neotropical migrants make each year and the dangers they face along the way. Being both local and global residents, students learn how actions at home as well as those in tropical habitats impact these birds' breeding and survival.

Ask students how they can protect habitat for their local birds. They may say by protecting their forest habitats in both places, which is the best way to protect Neotropical birds and many other creatures. But how can you help your birds across such huge boundaries and distances?

Have students learn about tropical crops like coffee and cacao. These two important food items (coffee and chocolate) only come from the tropics and grow best in the places many Neotropical migrant birds live. Farmers in many regions of Latin America chop down tropical forests to plant coffee, cacao and other crops to sell on the global market to consumers back home – like us. In the process, the forest homes and food resources provided by these forests to birds are destroyed. Are there any ways to protect birds and help farmers?

Materials –

- Access to the internet to read an article about Shade Grown Coffee and Birds.

Procedure –

1. Students read the article about Shade Grown Coffee on the Audubon website.
http://web4.audubon.org/bird/at_home/coffee/
2. Have students discuss the article. How can coffee farms be bad for birds? How can coffee farms be good for birds and people? Have students discuss the local to global relationship between a tropical crop like coffee and tropical rainforest habitat for birds and other animals. Why is shade grown coffee better? What is bird friendly coffee? How can you tell if this coffee is certified?
3. After discussing these topics, have students look at the Audubon list of birds that use shade grown coffee farms as a refuge.
http://web4.audubon.org/bird/at_home/coffee/species/index.html
4. Are student's migrant birds found in these habitats?
5. Lastly, have students list three ways we can protect Neotropical birds at home and in their tropical habitats. Some possible answers might be: 1. protecting their habitat here. 2. Protecting their habitat in the tropics with Rainforest Trust. 3. Buying and supporting shade and bird friendly coffee. 3. Limiting feral cats and predators in our own backyards. 4. Planting native trees that provide habitat to the insects migrant birds eat. 5. Setting out bird feeders in our backyards to help migrant birds find food.

Part III: Math and Geography

Idea – Students will learn about the great distances and energy costs of bird migration by calculating the same energy costs for themselves.

Materials –

- Materials for calculating math problems.
- World atlas.

Procedure –

1. Have students imagine they are a migrant bird getting ready for flight.
2. Calculate how many miles you must migrate from your temperate to tropical home and back again. How many miles would you fly in your whole lifetime?
3. Next, try to calculate your weight gain leading up to migration and weight loss after.
4. Calculate in human terms what that kind of weight gain would be before and weight loss after migration.
5. Next, using a calorie counter (online) estimate the calorie expenditure of your bird during its migration. What would it be for a person?
6. Find out the number of calories in one of your favorite foods. If you traveled by walking the distance a bird migrates how much of that food would you have to eat for your journey?
7. Finally, find out your bird's favorite foods and try to figure out how many insects or other food sources your bird would have to eat to fly that distance.

Part V: Creativity

Idea – Students go back to their chosen bird from Part I to design and draw a graphic representation of its migration route between its two homes and how it spends one year. At the end students will create a larger map putting together all of their birds individual routes as a class activity. As each student adds their bird they will present its natural history, migration route and other aspects of a year in its life ...

Materials –

- Drawing and art supplies.
- Paper or posters for drawing.
- Index cards
- Various colored string and yarn.
- Pins.
- World atlas.
- Materials for research (Internet, bird books, field guides)

Procedure –

1. Students review the bird species they chose from Part I.
2. On the blackboard, a bulletin board or on the floor draw a large map of North, Central and South America.
3. Next have students draw a smaller version of your map on individual paper or poster boards.
4. Have students draw their migrant species migration route between its two homes. They should draw a picture of their bird species, as well as drawings or icons on their map representing some fun facts like: types of habitat their bird likes best in each place, where it nests, what their bird eats, where in the canopy it feeds or nests, differences in behavior between sites, and other natural history information. Have students write labels throughout their map to educate others about a year in their bird's life.
5. When students are finished with their individual maps, have the whole class come together around the larger map.
6. Have each student present their map and explain the natural history of their migrant species to the class. As they do so, have each student take a different colored length of string or twine to connect a place in North America their bird lives to the place in Central or South America it migrates (or a chalk line for the floor). Label each piece of string for a particular bird species.
7. By the end of this exercise, there should be a class map with many different colored lines, each representing a different bird species migration and dual homes. Display students bird maps and drawings around the room.
8. Optional* Consider inviting another class or younger age group of students over for the class presentation on migratory Neotropical birds and their tropical and temperate habitats.

Part IV: Service Learning

Raise awareness about Neotropical birds and protect tropical rainforest! Put your lessons into action by organizing a fundraising campaign to protect tropical rainforest with Rainforest Trust.

For over 25 years Rainforest Trust has protected nearly 8 million acres. We have a long history of working with school clubs, student groups, and everyone who cares about saving the rainforest. To date many teachers, students, parents and youth groups have made meaningful contributions to the environment through Rainforest Trust by organizing rainforest fundraising events to help purchase and protect real acres in real places.

Consider one of our several fundraising ideas on our Rainforest Ambassadors page (<https://www.rainforesttrust.org/donation-options/rainforest-ambassadors/>) and read about our past success stories with Rainforest Ambassadors on our downloadable brochure. (<https://www.rainforesttrust.org/wp-content/themes/rainforest/ambassadors.pdf>)