



The Incredible Journey

Teacher

Background

The 49 species of shorebirds throughout North America all have two common characteristics: longer legs and longer beaks than other shorebird species. Shorebirds live in wetlands and feed along the edges of ponds, lakes, marshes, and coastal beaches. They must live by shallow water and muddy shores in order to find their food. Many different sizes and shapes of beaks help shorebirds specialize in ways of eating. They eat a variety of invertebrates: freshwater and marine worms, fly larvae called blood worms, shoreflies, danceflies, crane flies, amphipods, tiny clams, and snails.

Most shorebirds spend their summers in the northern areas of the United States and in Canada and Alaska. They migrate to southern United States, Central America, and South America to spend their winters in a warmer climate and return to the north in the spring. For instance, the Western Sandpiper's incredible spring migration begins in Mexico and ends in the Alaskan tundra to raise its young during the long summer days.

Shorebirds prepare themselves physically for their strenuous migrations by feeding almost constantly for two weeks. Before leaving their wintering grounds in the south, they put on a "fat load" to insure enough energy for flight. They often double their weight for their northward journey.

Some shorebirds fly non-stop to their destinations, but shorebirds like the Western Sandpiper make several stops along the way to replace their body fat and rest. These stop-over areas along the migratory route are also called staging areas. They are usually tidal flats and lowlands flooded from the spring snow melt and are very rich in marine life or newly hatched insects. Many shorebirds increase their body masses up to 100 percent at these staging areas!

Traveling over several different countries during migration, shorebirds must contend with a number of problems. Students will encounter these hurdles as they migrate through the game. Weather can be a factor and delay the journey. Peregrine Falcons and Merlins often attack shorebirds in flight as they migrate. There can be the impact of oil spills and agricultural pesticides like DDT along the migratory route as well, both contaminating shorebird food supplies. Radio towers are obstacles that kill thousands of migrating shorebirds each year. Many wetlands have been drained for agricultural or building purposes.

Once the shorebirds have arrived at the nesting grounds, there is no time to waste. The birds establish territory, pair, lay eggs, and incubate the eggs for about 20 days. The young fledge (learn to fly) quickly. At the nesting grounds, loss of wetland habitat and human recreation may affect nesting areas. Foxes and weasels may find shorebird nests for lunch.

Efforts to protect shorebirds and their wetland habitats are being made, however. Organizations like the Western Hemisphere Shorebird Reserve Network identify important shorebird sites and help protect them. There is increased awareness of the importance of wetlands and the need to preserve them.

The Incredible Journey will teach students that wetland habitats serve as important shorebird wintering, breeding, and staging areas.



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This activity is adapted from Ecosystems Matters: Activity and Resource Guide for Environmental Educators.

Description

By playing a shorebird migration game, students learn about the obstacles that shorebirds face as they migrate and the shorebirds' dependence on three wetland habitats.

Objectives

Students will be able to:

1. List three shorebird habitats
2. Name four hazards shorebirds encounter along their annual migrations
3. Explain how shorebirds depend on staging areas
4. Explain why shorebirds migrate annually from the far south to the far north of the Western Hemisphere

Time Required

Teacher Prep: 30 minutes

Activity: One 60 to 90-minute class period

Subjects

Environmental Science, Science, Geography, Physical Education, Social Studies, History

Skills

Comparing similarities and differences, Developing psychomotor skills, Kinesthetic Learning, Role playing, Understanding cause and effect, Applying information

National Science Standards

K-4: Life Science

Characteristics of Organisms

Organisms and their Environments

Science and Technology

Abilities to distinguish between natural objects and human-made objects

Unifying Concepts and Processes

Evidence, models, and explanation

5-8: Life Science

Populations and Ecosystems

Structure and function of living systems

Unifying Concepts and Processes

Evidence, models, and explanation

Materials

Map of the Western Hemisphere

Playing field or gymnasium

Cones, string, ropes or hula hoops to mark boundaries

Northern, Southern, and Staging Cards

Chalkboard or overhead projector

Preparation

1. Read the background information and cut the game cards apart. Examine the game cards so that you are familiar with the situations presented to students.
2. Using a playing field or a gymnasium, identify one end as the northern breeding grounds and the other end as the southern wintering grounds.
3. Place a rope or other line across each end of the playing field to mark edge of the southern wintering grounds and the northern breeding grounds. The place three circles with string or hula hoops spaced out between these grounds. See the diagram. The circles represent the staging areas where shorebirds feed and rest.
4. Disperse the cards upside-down in their respective areas. Distribute the Staging Cards evenly among the three "staging" circles, and spread the Northern Cards in the breeding area and the Southern Cards in the wintering area.

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Procedure

1. Talk briefly about migration, staging areas, breeding grounds, and wintering grounds. Show the map of the Western Hemisphere and locate the three main flyways that shorebirds use during migration. Explain that the students will be playing the parts of migrating shorebirds on the Pacific Flyway from Mexico to Alaska.
2. Explain the rules of the game. The first migration will begin at the southern wintering grounds. The “shorebirds” line up on the endline, and upon the teacher’s signal to begin migration, pick up a wintering card and follow the directions on the card. Players must return the cards (upside-down) in the same area before they continue their migration.
3. As the players run to the other side of the playing field, they must stop at each of the staging areas to “fat load” (refuel) unless otherwise instructed by the cards. They choose one card at each staging area and follow the directions before continuing.
4. The goal is to make it to the breeding grounds or the wintering grounds, depending on which way the students are heading. When a player reaches the opposite grounds, he or she waits until the next migration starts.
5. The next migration begins with players picking up a card in the breeding grounds upon the teacher’s signal. For example, a card from the breeding grounds may instruct its holder to take a person that has been labeled “dead” by another card and return them into the game as a young bird. Any player that picks up a card indicating death of the bird must drop out of the game and stand along the sidelines until an opportunity (eggs hatching in the North) arises to rejoin the game.
6. Select one or two players to represent the Peregrine Falcon and/or the Merlin as predators in flight. Their job is to tag students as they move between the staging areas. The “shorebirds” inside the confines of the staging areas are “safe” and cannot be tagged as they read the directions on the card. The predators must escort each tagged victim to the edge of the playing field before tagging another migrating student. Choose different students to play the predator roles before starting each migration.
7. The game concludes when players have made four complete migrations. One complete migration is south to north and back to again.

Evaluation

1. Plot the survival rate of each migration.
2. Review the three main flyways on a map of North and South America. For purposes of the game, players are to imagine they have migrated on the Pacific Flyway from Mexico to Alaska.
3. Ask players to share some of the unexpected situations described on their cards. Discuss how these things affect the migrating shorebirds.
4. Ask players to recall some causes of the birds’ deaths. Have them categorize the causes as “natural” and “human-caused.” They may need to define the criteria for each of these categories before listing the causes. Write them on lists on the chalkboard or overhead.
5. Discuss the list of human caused and evaluate the pros and cons of each of these situations. How do they affect other animals and people? For example, DDT was outlawed in the United States thirty years ago because it is very poisonous and is passed on from one animal to another and poisons each. Yet it save crops from infestations of insects.

Extensions

1. Working in small groups, students can research to learn more about specific shorebirds in their local area. Have students report on the shorebird and trace its migration route.
2. Visit a wetland near your community and list the different birds you see. Perhaps a person from the local Audubon Society could accompany you.
3. Invite a local Federal or State Wildlife officer to speak to the class about what impacts wildlife in your community and how students can help to lessen the negative impacts.
4. Have students create a role play/debate between a person in support of draining wetlands for agricultural or urban building purpose and a person in support of saving wetlands for migratory shorebirds. Allow students time to prepare their arguments.