



GRADE LEVELS

3 - 6

AN EVENTFUL JOURNEY

Bird **migration** refers to the regular seasonal movement of certain species of birds. Nearly all North American birds migrate between their breeding areas and their wintering areas. Each species has its own special requirements for food and time for breeding; hence, they migrate at different times (Figure 5). A major stimulus for bird migration is the seasonal change in the amount of daylight. In spring, lengthening days trigger hormonal changes in birds that prompt northward migration. In autumn, decreasing daylight effects similar changes that prompt southward migration. The benefits of migrating include increased availability of food and of nesting territories as well as escape from extremes of climate.

During migration birds encounter many obstacles. They need to rest and feed during their flight north or south. Severe weather, lack of food, destruction of prime **habitat** through alteration or pollutants, and human harassment are all problems which may result in diminished numbers. As a result of these obstacles, it is estimated that many species have a 50% mortality rate during migration and in young birds it may be as high as 80%.





Ornithologists study migration in several ways. One way is simple observation: count the number of birds that fly through a specific area during a specific time period. New Jersey Audubon Society conducts regular hawk and seabird counts in the fall. Ornithologists also study migration by banding birds. Bird banding involves catching birds alive and placing small, individually numbered aluminum bands on their legs. When banded birds are recaptured or found dead elsewhere, scientists gain facts about where they go, how long they live, and the **physiological** changes caused by their migration.

Scientists use the information they collect from counting and banding birds to detect upward and downward trends in bird populations. A declining trend will sometimes warn that there may be a problem in the environment.

New Jersey is in the heart of the Atlantic Flyway, one of the four major migratory pathways in North America. This makes New Jersey's habitats some of the most important habitats for migrating birds.



BASIC CONCEPTS

-  Migration is a regular seasonal movement.
-  New Jersey is in the Atlantic Flyway; birds that migrate through the state use its habitats as resting and feeding areas.
-  Birds encounter obstacles created by natural phenomena and human behaviors.
-  People have the ability to minimize some of these obstacles by preserving critical habitats, conserving open space, and planning new development that is compatible with our natural resources.

MATERIALS

- 24 migration statements (Figure 6)
- ten risk statements (Figure 7)
- 34 3 x 5 index cards
- three gummed labels
- magic marker
- glue or stapler
- 24 clip-on clothespins (optional)

PROCESS SKILLS

Inferring, predicting, interpreting data, formulating hypotheses, communicating.

PREPLANNING

1. Prepare a set of journey cards. Copy the sample migration statements (Figure 6). Cut and attach each to an index card.
2. Clip one clothespin to each card to prevent the cards from blowing away (optional). These cards will be used to form a simulated migration path.
3. Prepare a set of risk cards. Copy samples (Figure 7). Cut and attach to index cards. Mark the back of each card with "RISK." Clip cards together with a clothespin.
4. Find an appropriate location for the game (indoors or outdoors). You will need

approximately 100 feet of clear pathway for the students to follow with separate starting and ending points. The pathway does not have to be linear.

5. Mark each gummed label with an "x". Place them at the end of the pathway. (There are three mortality cards. The students who come to the finish line with these cards get a label stuck to their forehead and are asked not to divulge what happened to them.)
6. Wait until the game is about to begin before placing the cards on the pathway.

MOTIVATIONAL ACTIVITY

Engage the students in a discussion about plans for a journey. You are going on a trip to Florida. What are some things that would help you get there? (fair weather, car in good condition, fuel, airplane, money for fares, food, suitcases, place to sleep along the way)

What are some things that would upset your plans along the way? (flat tire, breakdown, accident, no places to eat or sleep on the way, lost or stolen money, plane crash) [Analyzes and classifies data.]



PROCEDURE

1. Explain to the students that they are going to pretend to be migrating birds.
2. Create a migration path with the journey cards by placing each card face down at four-foot intervals along the pathway.
3. Risk cards should be set in a pile off to the side of the pathway.
4. The ideal number for this game is 12. When the class size is larger, students can travel in twos or threes and “fly” as a single unit with their group to each space.
5. Divide the class into three groups. As you designate a student or group to be an early, middle or late migrant, (Figure 5) show them a picture of the bird. Visit www.webshots.com for samples.
6. Beginning with the first group of migrants, assign each student/unit a number from one to four.
7. Start the game by sending the first group (early migrants) onto the pathway: first student/unit to card #1, second to card #2, etc.
8. Instruct the students to pick up the card, read it, replace it face down, and do what the card tells them to do. Anytime someone else is using the card they are sent to, they are to go to the risk pile and follow the instructions on the card that is picked. If a number along the migration path is missing or out of sequence, go to the next card in the path.
9. As the travel cards are vacated by the early migrants, middle migrants enter the pathway. Then repeat the procedure with late migrants.
10. When most have reached the finish, assemble for discussion. (Note: Some students may get caught in a holding pattern. This is not unusual as many young birds do not breed until their second year.)

Putting It All Together

- ? Let’s talk about your journey. What obstacles did you encounter as birds? [Describes specific events] Which of those obstacles were created by people? (powerlines, plastic fishing line, pollution, lighthouses, glass buildings) Which were natural phenomena? (hawks, cold snaps, difficult winds, storms) [Interprets data.]
- ? What things helped you complete your migration? Which of these were created by people? (bird feeders, wildlife refuges) Which were natural phenomena? (good winds, plenty of food) [Analyzes and classifies data.]
- ? Why didn’t all of you finish at the same time? (Birds migrate at different times, birds were held back by obstacles, and they were advanced by helps.) [Draws inferences from unstated facts.]
- ? What do you think happened to the ‘birds’ with the ‘Xs’ on their foreheads? (They died.) [Draws conclusions.]
- ? What kinds of habitats would birds use as they migrate through New Jersey? (marshes, mountain ridges, fields, coastal areas, lakes, ponds, streams, rivers, swamps, woodlands) [Applies knowledge to practical situation.]
- ? What should people consider when altering a natural habitat by building and development? (Current use of the area by wildlife and migrating birds, what impact the development would have, and whether development would displace animals permanently.) [Identifies criteria and draws conclusions.]



Take Another Step

- ✓ Plant shrubs, trees, or vines that will produce wild food (seeds, berries, flowers, etc.) around the edge of your schoolyard or lawn. These will attract migrating birds.
- ✓ Evaluate your community. List the things that would help birds migrate and those which would interfere with migration.
- ✓ Erect and monitor a feeding station on the school grounds. Keep a daily log and make seasonal comparisons of the birds that come to feed. Note: A feeding station can be as simple as scattered seed on the ground near a tree or bush.
- ✓ Research the birds you have seen at the feeding station. Categorize them into winter visitors and year-round residents. Why are some birds able to survive the winter without migrating? (Winters are milder, birds change their diet or have a varied diet.)
- ✓ Make a list of winter birds other than those seen at your feeding station. Where do they come from and why are they here?
- ✓ On a map of New Jersey, locate all the sites mentioned on the journey cards.

FOR MORE INFORMATION

Dunne, Peter J., Richard Kane, and Paul Kerlinger. *New Jersey at the Crossroads of Migration*. (text and video)

Brian Vernachio, Don Freiday and Dale A. Rosselet. *Wild Journeys: Migration in New Jersey*. NJ Audubon Society, 2003.

National Geographic Society. *Bird Migration in the Americas*. (map)

Opus and Massachusetts Audubon Society. *Audubon Alliance Bird Identifier*. (chart)

Peterson, Roger Tory. *Eastern Birds*.

Sutton, Patricia. *Backyard Habitat for Birds: A Guide for Landowners and Communities in New Jersey*.

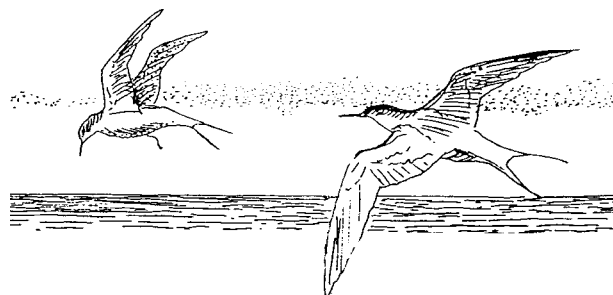


Figure 5

New Jersey Birds Migration Chart

The following is a partial list of birds that migrate to or through New Jersey.

EARLY MIGRANTS

late February through mid-April

Common grackle
Turkey vulture
Red-winged blackbird
Eastern bluebird
Yellow-shafted flicker
Red-tailed hawk
Saw-whet owl
Ring-necked duck
Pine warbler
Ruddy duck
American robin
Killdeer
Eastern phoebe
Northern harrier
Northern pintail

MIDDLE MIGRANTS

mid-April through mid-May

Field sparrow
Ruby-crowned kinglet
Solitary sandpiper
Least tern
Whip-poor-will
Eastern kingbird
House wren
Veery
Blue-winged warbler
Yellow warbler
Ovenbird
Northern oriole
Scarlet tanager
Rose-breasted grosbeak

LATE MIGRANTS

mid-May through mid-June

Willow flycatcher
Red knot
Mourning warbler
Blackpoll warbler
Bay-breasted warbler

Figure 6

Migration Cards

Photocopy and mount on 3 x 5 index cards.

1. WATCH OUT !!! Power lines ahead in Long Valley. Don't hit them! Crawl ahead four spaces on your hands and knees.

2. Many berries and insects are available in this overgrown field in West Milford. Smack your lips four times and move ahead four spaces.

3. You land in a polluted marsh and become sick from the food you eat. Sit down, hold your stomach for a count of 30, groan ten times, then move ahead two spaces.

4. Watch out for the Sharp-shinned hawk! It wants to eat you. Freeze, count to 40, then move ahead three spaces.



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5. You escape being caught by a cat in Freehold but slightly sprain your wing in the escape. Get it back in shape. Slowly swing your left arm around ten times and move ahead one space.

6. Scientists at the Cape May Bird Observatory catch you for research. After putting a numbered metal band on your leg you are set free. Move ahead three spaces.

7. You got tangled in a plastic fishing line near the Shrewsbury River. You can't eat and are weak from hunger. A kind person takes you to the nature center at Sandy Hook where the ranger cuts away the line. Hop on one leg in a circle, count to 40, then move ahead four spaces.

8. You find a bird feeder in a fifth-grader's backyard in Vineland. Spend a few days enjoying the free food. Chew 20 times and move ahead five spaces.

9. It's raining, it's pouring, and you don't want to fly in this rainstorm. Count to 50 while you wait for the storm to stop, then move ahead four spaces.

10. You can't find the spot you came to last year because a new shopping mall has been built on the site. Walk around in three wide circles searching for a place to rest and feed. Because you are still hungry you have only enough strength to move ahead one space.

11. While traveling at night, you become confused by the beam from Barnegat Lighthouse on the New Jersey coastline. You are tired from flying in circles and can't continue. Sit down, count to 40 and move ahead three spaces.

12. You arrive at the Delaware Bay shore when the horseshoe crabs lay their eggs in the sand. Yum! Rub your stomach 15 times and move ahead four spaces.

13. You are able to fly a long distance in one day because of good winds along the Kittatinny mountain ridges of western New Jersey. Move ahead four spaces.

14. It's hard to find caterpillars to eat because the forest was sprayed with an insecticide. Open and close your eyes 25 times while you look for food and move ahead one space.



15. Strong winds from the wrong direction keep you from migrating. Go back three spaces.

20. After flying for several days you land in the Great Swamp National Wildlife Refuge. Spend time feeding on berries in a thicket. Pretend to pick 10 berries from a bush, then move ahead one space.

16. You become covered with oil from a spill in the Arthur Kill near Newark Bay. Although rescued, you do not recover. The game is OVER for you. You died! DON'T TELL ANYONE. Take this card with you. Go to the finish and place a gummed sticker on your forehead. Sit down and wait for the others to finish.

21. Oops! An unexpected freeze kills off all the insects that you usually eat. Go back two spaces as you try to find more food.

17. You just flew into a tall glass building in Trenton. Sit down, hold your head, count to 35 and move ahead two spaces.

22. A hurricane blows you into the Atlantic Ocean off Mantoloking. You rest on the water, but get eaten by a gull. The game is OVER for you. You're dead! DON'T TELL ANYONE. Take this card with you. Go to the finish and place a gummed sticker on your forehead. Sit down and wait for the others to finish.

18. A good wind helps you fly. Move ahead four spaces.

23. Strong winds along the Delaware River blow you off course. Go back six spaces.

19. You have been shot with a BB gun. The game is OVER for you. You're dead! DON'T TELL ANYONE. Take this card with you. Go to the finish and place a gummed sticker on your forehead. Sit down and wait for the others to finish.

24. Spend five days resting and feeding on the mudflats at Brigantine Wildlife Refuge. Count to 40. Because you are so strong you can fly to the finish!



Figure 7

Risk Cards

Photocopy and mount on 3 x 5 index cards.

Go to card #9

Go to card #23

Go to card #18

Go to card #3

Go to card #24

Go to card #6

Go to card #5

Go to card #15

Go to card #10

Go to card #17



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