

Flying to Survive - The Migration Cycle



✿ Hook: Getting From Point A to B

- Ask students to imagine they walk to the grocery store but when they get there, it has closed. Discuss what they would do? Search for another store? What would happen if the next store they tried has also closed? Where would they get their food? How long would they have the energy to keep looking? How would this affect their behaviour?
- Compare their walk to the store to the migration cycle – but remember, birds can take 6 to 8 weeks and cover thousands of kilometres when they migrate. Along the way they must stop daily to find food and shelter in their natural habitat. When some of these areas disappear, it makes the journey harder, just like it would for humans if more and more grocery stores closed down.
- Explain that today they will learn about natural habitats and the threats faced by birds along their migration journeys!

Background: Migration Adaptation

Adapted from Ducks Unlimited Canada

Each year millions of birds fly thousands of kilometers, stay for sometimes only 6 weeks, and then begin the journey back again. Migration is a behavioural adaptation that boosts a bird's chances of both survival and successful reproduction. However, migration presents many risks. Headwinds and storms, unseasonal temperatures, disease and predators (especially cats) are all natural hazards faced along the way. Human-made dangers include automobiles, trains, airplanes, power lines, high buildings, towers and windows. On a larger scale, the development of roads, buildings, new communities and mines contribute to the fragmentation (cutting up) and loss of natural habitat.

Birds are supremely adapted for migration. Some species migrate further than others, but size is not necessarily an indication of how far a bird will travel (e.g. the tiny hummingbird migrates farther each year than many larger birds). Physical adaptations for flying long distances include long pointed wings, large lungs and heart, air sacs, large chest muscles, hollow lightweight bones and a streamlined body shape.

Bird feathering is also related to different migratory strategies. Some birds that migrate long distances, moult their flight feathers each year and grow fresh ones to maximize flight efficiency. Birds that migrate shorter distances may moult their flight feathers slowly over several years and use remaining energy for other purposes.

Birds often migrate at night, which reduces the chances of overheating, dehydration and predator attack, and allows for use of favourable winds. To some degree migrating in a flock protects individual birds from predators, and formation flying reduces energy expenditure. They migrate in community and then disperse. Birds must feast before migration on berries or insects and

Age range: 8 to 12

Time: Two 60-minute sessions
(one indoors, one outdoors)

Themes: The threats and benefits of bird migration, and the habitats that support it.

Resources

- *Habitat: There for the Birds!* info sheets
- Migration Cards (1 per game habitat)
- class set of worksheets: *Migration Match-Up*
- 10 to 15 large hula hoops (or chalk or rope for marking habitats)
- student Internet access
- outdoor play area or gym
- migration props: clothespins, elastics, pipe cleaners, twist ties, stopwatch

Learning Outcomes

Students investigate the threats and benefits of bird migration by participating in online and outdoor activities.



other high-energy foods to build fat stores for the journey ahead. Different bird species use different foraging behaviours en route, and their beak shapes factor into this.

How birds navigate during long migratory journeys is not completely clear. It is believed that they find their way using a combination of methods: position of the sun and stars, Earth's magnetic field and natural landmarks such as mountains and habitat areas.

To avoid the stresses of migration, some bird species breeding in southern parts of their ranges (e.g. American robin) have adapted to the point where they keep long distance travel to a minimum and do not migrate each year (depending mostly on weather and the availability of food).

We can all do our part to help migrating birds. Since migration requires large amounts of energy, and birds must be able to find adequate food and safe areas to rest, we must focus on protecting their natural habitats. Community conservation programs, wildlife refuges, wilderness clean-up initiatives and public education are just a few of the positive factors that can enhance migration success.

Hands-on Activity: Bird Migration 101

1. Share *Background: Migration Adaptation* notes with the class.
2. Have the students go online and play the online *Flying to Survive!* migration game: www.bonnecherepark.on.ca/games/game-birds.html
Then ask them to take the *Habitat: There for the Birds!* interactive quiz: www.bonnecherepark.on.ca/games/quiz-birds.html
Remind them to hand in their scores.
3. Ask class to complete the *Migration Match-Up* worksheet (next page).
4. Take up answers.

Discussion

- Did you know that many birds spend most of their lives migrating?
- What would it feel like if you had to spend much of your life searching for food?



Name: _____

Migration Match-Up

Use these words and phrases to answer the questions below.

- | | | | |
|----------------------------|-----------------------|-------------|------------|
| berries and insects | flock | night | human-made |
| global warming | large bodies of water | Arctic Tern | cats |
| habitats | Cowbird | moulting | natural |
| breeding or nesting ground | migrant | navigate | coffee |



1. The natural areas required by birds during migration, wintering and nesting:

2. Bird migration hazards such as towers, airplanes, wind turbines and habitat fragmentation are...

3. The summer home of a bird species:

4. Birds fly in this formation to save energy:

5. Birds use sun, stars, familiar landmarks and Earth's magnetic poles as natural elements to:

6. These domestic animals are a HUGE cause of bird deaths:

7. This farm bird forces other birds to act as surrogate mothers for their hungry hatchlings:

8. Bird migration hazards such as high winds, storms and cold temperatures are...

9. This migration champion flies from Canada to Antarctic to Europe and back every year:

10. Birds feast on these to build up fat before migrating:

11. The process when a bird loses its feathers so that it can grow new ones:

12. Some birds migrate over and others migrate around these natural features:

13. The effects of overheating, dehydration, predators and winds are reduced when birds migrate at...

14. Production of this popular drink is threatening bird habitats in tropical regions:

15. This phenomenon causes birds to migrate too early to their breeding grounds, before berries, insects and other food sources are ready:

16. The term used to identify a bird species that migrates:



Migration Match-Up



1. The natural areas required by birds during migration, wintering and nesting are called:
habitats
2. Bird migration hazards such as towers, airplanes, wind turbines and habitat fragmentation are:
human-made
3. The summer home of a bird species is called a:
breeding or nesting ground
4. Birds fly in this formation to save energy:
flock
5. Birds use sun, stars, familiar landmarks and Earth's magnetic poles as natural elements to:
navigate
6. These domestic animals are a HUGE cause of bird deaths:
cats
7. This farm bird forces other birds to act as surrogate mothers for their hungry hatchlings:
Cowbird
8. Bird migration hazards such as high winds, storms and cold temperatures are:
natural
9. This migration champion flies from Canada to Antarctic to Europe and back every year:
Arctic Tern
10. Birds feast on these to build up fat before migrating:
berries and insects
11. The natural process that causes a bird to lose its feathers so that it can grow new ones, is called:
moulting
12. Some birds migrate over and others migrate around these natural features:
large bodies of water
13. The effects of overheating, dehydration, predators and winds are reduced when birds migrate at:
night
14. Production of this popular drink is threatening bird habitats in tropical regions:
coffee
15. This phenomenon causes birds to migrate too early to their breeding grounds, before berries, insects and other food sources are ready:
global warming
16. A bird species that migrates is called a:
migrant



Outdoor Activity: The Migration Cycle

1. Prepare the activity area ahead of time:
 - a) Label one end the Wintering Grounds (south), and the other end, the Summer Breeding Grounds (north).
 - b) Place hula hoops or circles along a scattered path between these two points. (You can draw circles in the dirt or sand with a stick, use chalk on pavement, or wind rope in a ring). If possible, use different circle sizes and space them variably but no more than five giant footsteps apart. Each circle represents a different habitat.
 - c) Place a Game Card in each circle, using stones to weigh them down.
 - d) At the Summer Breeding Grounds, place a stack of elastics and/or pasta (worms and insects) on a table, chair or tree stump.
2. Explain to students that they are each playing the role of a bird that migrates annually between its Summer Breeding Grounds in Renfrew County and its Wintering Grounds in the Dominican Republic. Point to these areas first on a map, and then in the activity area.
3. Have students form several V-shaped flock formations (about 7 students/flock) at the Wintering Grounds and explain the rules of the game:
 - a) The object of the game is to fly from the Wintering Grounds to the Summer Breeding Grounds, stopping ONLY in the habitat circles. Any other area is unsafe and birds who don't make it to a habitat die.
 - b) When the teacher blows the whistle, birds will fly from one habitat to the next in a forward direction, flapping their wings and taking NO MORE THAN FIVE STEPS. If they don't make it in five steps, they die. If the habitats are different sizes, all the students may not be able to fit within the circle. This is also a reason why birds do not succeed in their migration, because there is not enough area to sustain them.
 - c) At each habitat, one student reads the Migration Card and all birds follow the instructions.
 - d) Once all birds are in their place, the teacher blows the whistle and birds fly to the next habitat of choice.
4. Start the game by saying: "Remember: only five steps, and flap your wings. It is now Day One. Let's take our steps and fly (blow whistle) – 1, 2, 3, 4, 5!" As birds arrive, players should keep track of the order they arrive. The birds that aren't able to reach a habitat in five steps are dead and must line up at the side of the course.
5. At each habitat, one player reads the Game Card and the birds must follow these directions. Once all players have completed their tasks, the teacher blows the whistle and Day 2 begins: "1, 2, 3, 4, 5, steps to the next habitat." Repeat until all live birds reach the Summer Breeding Grounds (Renfrew County). All surviving birds are consolation winners of the game.
6. At the Summer Breeding Grounds, each surviving bird can pick one of the dead birds to hatch and come to life again.
7. Explain that food is usually more plentiful in Summer Breeding Grounds than in Wintering Grounds, so now is the time for all birds to eat as much as they can to breed successfully and build energy to migrate south again. All birds form a single line. One-by-one, each student is timed (15 seconds) while using a clothespin to transfer pieces of elastics, pipe cleaners and twist ties from one pile to another. The top three birds (ie: those that transfer the most food) get to start the return migration by proceeding to their first habitat, while the other birds start from within the Summer Breeding Grounds.



8. Explain that even though you only arrived six weeks ago, the weather is starting to get cold, and it's time to make the long flight south to the warmer Wintering Grounds. Repeat the migration process. You will notice that some birds will start making adaptations to avoid troublesome habitats.
9. All birds that survive the return migration are consolation winners. Players that survived both migrations win the game!

Discussion

- How many birds started the game?
- How many survived the migration north?
- How many birds survived the migration south?
- How many survived north and south migration?
- How does habitat loss change the lives of birds?
- Did you adapt your behaviour on the return migration to avoid trouble spots?
- What are some human-made threats to bird migration?
- What are some natural threats to bird migration?



Urban development has taken over your habitat. You are very tired and must find food and shelter fast. Take only two steps to find another habitat BEFORE the whistle. If you can't – you die!

You land in a wildlife refuge where there is plenty of good food and protective covering. Move to the next habitat BEFORE the whistle.

Heavy rains are flooding this wetland. There is some food but not enough. The last 2 birds to arrive find no food and must return to the previous habitat BEFORE the whistle.

Boys playing nearby have spotted you. They throw rocks into the trees and kill the last bird that arrived at this habitat.

A hungry coyote lies hidden in the bushes nearby and is waiting for easy prey. All birds must fly back to the previous habitat BEFORE the whistle.

Kids playing with matches have started a fire and damaged this prairie field. The first two birds that landed here die. BEFORE the whistle the remaining birds must take only three steps to another habitat – or die!



A new mini-mall is being built right next to this wetland and there is litter scattered around. The second bird that arrives here gets tangled up in a plastic bag and dies.

Rainy season means this wetland has become a smorgasbord of insects. All birds can eat as much as they like then move to the next habitat BEFORE the whistle.

Farmers have sprayed these fields with pesticides. When you eat the grasshoppers you get sick. The last 2 birds to arrive at this habitat die!

A cell phone tower has been erected on your traditional migration route. The first bird to arrive at this habitat hits the towering structure, falls to the ground and dies.

This small creek is polluted causing the aquatic insect population to dwindle. This means less food for you to eat. ON YOUR NEXT TURN take only 4 steps to reach a new habitat – or die!

A highway is being built through this deciduous forest. The trees that you used to stop at are gone. All birds must return to the previous habitat BEFORE the next whistle.

A cat is sitting below this tree. The last 2 birds to arrive look for a safer place at the previous habitat BEFORE the whistle.

A local manufacturer accidentally spilled toxins into this lake. When you land here, you realize you can't stay. BEFORE the whistle all birds must take only three steps to reach another habitat.

This rainforest has been cut down to create a new sun-grown coffee plantation. This leaves no room for birds. All birds must fly back to the previous habitat BEFORE the whistle.

A golf course has been built on this wetland leaving very little habitat for migrating birds. The first bird can stay; the remainder can take 3 steps to any other habitat BEFORE the whistle.

You find plenty of ripe berries here. Everyone eats lots to build up fat and energy for tomorrow's flight.

The shade trees in this urban woodlot provide food and shelter for the night. You will be ready to take flight after a good night's rest.



Since this farmer grows shade-grown coffee, there is plenty of food and shelter here for your flock. Have a good rest.

The students in this school have filled their bird feeders. There is lots of good food for everyone, so enjoy! Tomorrow you will fly again.

This cornfield has lots of food and there's a creek nearby with fresh water. This is a perfect place to spend the night.

You have landed on a thin strip of rainforest with predators all around. By staying quiet you survive the night.

The flock you are flying in gets hit by a transport truck. Only the first two birds survive. All others die!

This urban woodlot is a safe refuge on your long migration. Spend the night here and take advantage of a ready supply of energy building food.