Ecology in Classrooms & Outdoors

BIRD-O
TEACHER GUIDE

INTRODUCTION

Birds are one of the most diverse groups of vertebrates on Earth, and can be found on every continent of the planet. In fact, scientists have studied between 10,000-18,000 species of birds! In this lesson, students are introduced to ornithology, the study of birds, by learning about bird behavior and participating in birdwatching. Then, students head outdoors with a BIRD-O bingo board to see how many different bird behaviors they can observe in their neighborhood or nearby green space.

MATERIALS

- BIRD-O activity sheet
- BIRD-O worksheet
- Pencil
- Binoculars (optional)

GUIDING QUESTIONS

1. How does birdwatching help to understand birds and their behavior?
2. In what ways do birds communicate, move, and behave to help them survive?

NEXT GENERATION SCIENCE STANDARDS

3-LS4-2 Biological Evolution: Unity and Diversity
Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

MS-LS1-4 From Molecules to Organisms: Structures and Processes
Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

LESSON PROCEDURE

1. Introduce ornithology
Explain to students that for this lesson they will be **ornithologists**, or scientists that study birds. Ornithologists study a broad range of topics all related to birds: bird calls, reproduction, anatomy, distribution, and behavior. Tell the students that for this lesson, the class will focus on **bird behavior**.

ASK: WHY STUDY BIRDS AND THEIR BEHAVIOR?

Studying bird behavior can help scientists find out more about the way birds relate to other birds, other animals, and live within their environment. In turn, this can help people create data-based policies to help better protect birds and their habitats. Birds are often used as an indicator of habitat health as a whole, as they often have particular or unique habitat requirements.

2. Flying behaviors
A major category of bird behavior has to do with flying. Some different forms of flight are described below:

- Gliding: vultures and hawks commonly take a break from flapping their wings by gliding, gradually decreasing in height.
- Soaring: this is similar to gliding. Birds fly in circles and soar on their long broad wings with no wing flapping. Unlike gliding, birds that soar are able to use columns of air currents to maintain their height.
- Undulating: this is a rollercoaster style of flight where birds such as woodpeckers and finches flap their wings during the rising phase, then glide as they descend into the valley of the wave.
- Formation: one of the most recognizable patterns is the V formation and is used by migratory birds such as geese. The lead bird and outside positions of the formation are the most physically difficult, so the flock members take turns at these positions to help conserve energy.

Migrating, traveling long distances, and flying in general costs birds a lot of energy and the above flight patterns allow them to conserve precious energy. Birds that glide or soar are often hunting for prey or searching for carrion (dead animals) to feed on.

- Direct flight: many species including ducks and herons fly in a straight and level path while continuously flapping their wings.
- Hovering: hummingbirds can do this at will because of a unique flexible shoulder joint. Other birds, such as kestrels and kingfishers, can hover briefly by flying into the wind.
- Diving: this could refer to diving in air or water. Birds such as ospreys and peregrine falcons fly high, turn downward, and tuck their wings into their body to dive in the air. Birds such as cormorants and dippers dive in the water using similar body movements as birds that dive in the air; they tuck their wings into their body and plunge into the water. Once under water, some birds swim using their feet and some swim using their wings.
- Flushing: birds are flushed when they are startled into flight, often flying in a zig-zag, triangular, or erratic pattern.

Many different forms of flight revolve around how birds get their food. For example, some ducks fly in a level path over water in order to find food. Similarly, hummingbirds hover to conserve energy while finding nectar, while a kestrel might hover in order to keep its head still enough to find its prey. Diving, either in air or water, allows birds to ambush their prey. Also, many birds are food for other animals, so the more unpredictably a bird flies, the harder it is to catch.

3. Non-flying behaviors
In addition to the different flight patterns, there are also a few non-flying behaviors they will need to know for the activity.

- Preening: this is a bird's way of grooming its feathers. To keep them in good condition, birds remove dust, dirt, and parasites and realign each feather.
- Flittering/fluttering: when birds flap their wings repeatedly to communicate, often in relation to finding a mate.

The rest of the behaviors on the BIRD-O board are tree-climbing, walking, hopping, swimming, pecking, perching, sunbathing, drinking, eating, singing, sitting in a row, a flock, nest-building, and bathing (in water). Tell students that for some of the behaviors on the board they do not necessarily have to see a bird physically doing the action; instead, they could find signs of the behavior. For example, instead of spotting a woodpecker, they could search trees for holes and check off “pecking.” Or, to check off "nest-building", they could find a nest.

4. Go birdwatching
Have students download and print the BIRD-O activity sheet and game board. If students do not have access to a printer, they may use the activity sheet and game board on a mobile device and use a piece of paper to record the behaviors they observe.

Invite students to go outdoors and find a good spot for birdwatching. Remind students that when birdwatching, it is best to sit as still and quietly as possible. Often people hear birds before they see them. In general, birds are most active at dawn and dusk, but there are no bad times to go birdwatching! Students should use their BIRD-O board to record the different bird behaviors they observe.

CUSTOMIZE IT!

There are many ways students can use their BIRD-O board, so feel free to change the timing of the activity or challenge students to try to get different patterns. Below are some options to choose from:

- Try different BIRD-O patterns: five across, five down, diagonal, or fill the entire board
- Try to get a BIRD-O in one session of birdwatching
- Spend a week birdwatching in short sessions and record observations to get a BIRD-O
- Record how many times they have observed each behavior by putting check marks in each box