eBird: A Citizen Science Project
Lesson Plan

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Rationale

This lesson explores how students can contribute to bird research and conservation as citizen scientists. It begins with an introduction to different types of birds in their local habitat, and then shows how they can report their sightings to eBird. The lesson is designed for a high school audience but could be adapted for primary levels.

First Peoples Principles of Learning

- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits and the ancestors.
- Learning is holistic, reflexive, reflective, experiential and relational.
- Learning involves recognizing the consequences of one's actions.
- Learning involves patience and time.

Curriculum Connections

Life Sciences 11

Big idea: Organisms are grouped based on common characteristics.

Curricular competencies:

- Collaboratively and individually plan, select and use appropriate investigation methods, including fieldwork and lab experiments, to collect reliable data (qualitative and quantitative)
- Experience and interpret the local environment
- Consider the changes in knowledge over time as tools and technologies have developed
- Contribute to care for self, others, community and world through individual or collaborative approaches

Content: Levels of organization; taxonomic principles; binomial nomenclature.

Environmental Science 11

Big idea: Complex roles and relationships contribute to diversity of ecosystems.
Curricular competencies: Same as Life Sciences 11.

Content: Levels of biotic diversity; human actions and their impact on ecosystem integrity.

Estimated time required: 120 minutes

Lesson Activities

Materials

- Cellphone
- Binoculars (optional)
- All About Birds worksheet (below)

Introduction to citizen science

1. **Class discussion.** Introduce the term *citizen science*. Ask students what they already know about citizen science. Explain the what, who and why of citizen science:

   - *What is citizen science?* Citizen science is a collaboration between scientists and community members to collect and share data on a science project. There are citizen science projects in many areas of science such as ecology, medicine, genetics, computer science and psychology. Check out the Government of Canada portal to learn about 50+ citizen science projects in Canada. This lesson focuses on a citizen science project for birds, called eBird.

   - *Who can be a citizen scientist?* Anyone can be a citizen scientist! The term *citizen science* is widely used in the public but is also known as *community science* or *crowdsourced science*, as participants do not have to have a specific title to participate in a project. Show the real-time submission data on eBird to explore how people from around the world contribute to citizen science projects daily.

   - *Why citizen science?* Citizen science programs provide scientists access to large samples of data from around the world, which would otherwise be difficult to collect on their own. Most citizen science projects have specific guidelines for data collection, so that data collected by many participants can be combined and lead to high-quality analysis. The data can be then used to guide conservation laws, policies and actions. Watch this video on how eBird could be useful.

Learn about bird types

2. **Play with Merlin Bird ID.** Before contributing to eBird as citizen scientists, students need to learn how to identify birds in their local area. Ask students to download a free app on their phones called Merlin Bird ID. Watch this introductory video on how to use the app. Take students outside to see if they can identify some birds in the school neighbourhood! Bring binoculars, if you have any. This will also be a good time to discuss two concepts in Life Sciences 11 and Environmental Science 11:

- **Binomial nomenclature:** Scientific names are made up of two parts: the genus and species. For example, a Bald Eagle is *Haliaeetus leucocephalus*. *Haliaeetus* is the genus name, and *leucocephalus* is the species name. They are always italicized, with only the genus capitalized. Notice that both common names and scientific names are provided on Merlin Bird ID.

- **Levels of ecological organization:** *Species* are groups of individuals that interbreed and produce fertile offspring. A *population* is a group of organisms of the same species living in the same area at the same time. A *community* is a group of populations that live and interact with each other in the area. Lastly, an *ecosystem* is a community that interacts with its abiotic (non-living environment). Students should be able to find all four examples on their short walk outside.

  Species
  ↓
  Population
  ↓
  Community
  ↓
  Ecosystem
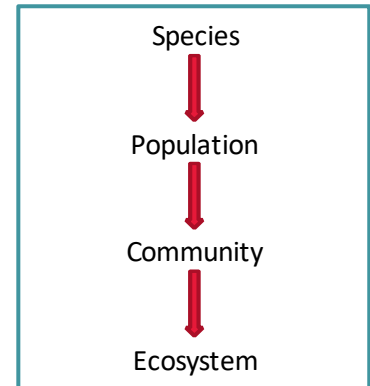
3. **Select a specific bird.** Once students are back in the class, invite them to learn more about a bird that they are interested in. Alternatively, they can go to Explore Birds in the Merlin Bird ID app, which gives a list of birds from the area. Make sure that each student in the class has chosen a different bird, ideally a bird from each category.

4. **Research a bird.** Ask students to visit the All About Birds website to learn more about their bird. Once students type in the name of the bird in the search box, they should be led to a page with the ID info and life history. Complete the worksheet below.

5. **Share their findings.** Invite students to get together in small groups to share what they found out about their bird. Later as a class, discuss what all birds have in common (i.e., what makes a bird a bird), and what makes them different:

   - *What do birds have in common?* Birds belong to the class Aves. They are in the kingdom Animalia, phylum Chordata and subphylum Vertebrata, which means they have features associated with all vertebrates such as a backbone. All birds have feathers, a four-chambered heart and a lightweight skeleton. Their wings are adapted for flight (they are modified forelimbs), and they lay hard-shelled eggs.

   - *What makes bird species different?* The four keys to bird ID include size and shape, colour pattern, behaviour and habitat. A full taxonomy of birds is found here. However, the taxonomy changes frequently when new information becomes available.

Contribute to eBird

6. **Download eBird.** Invite students to download a free app on citizen science called eBird. Watch this introductory video on how to contribute to sightings on eBird. eBird can be used together with Merlin Bird ID; that is, students can use Merlin Bird ID to identify the birds, and then submit their data to eBird.

7. **Go outside!** Find a place near your school to take your students on a field trip. In the Explore tab on eBird, you can find birding hot spots where birds have been most observed in your community. Bring binoculars if you have any! You might also consider bringing bird identification books or

printing out a photo identification guide for birds in your area. If a field trip is difficult, you could consider a walk to a city park near your school. For field trip support, visit Habitat Conservation Trust Fund grants.

8. **Contribute to eBird.** Ask students to identify the birds that they see, and then submit their data on eBird. Remind students about the importance of contributing to scientific research—every submission can make a difference!

All About Birds

Select a bird in your neighbourhood using Merlin Bird ID, and complete the information below.

Name of bird (common and scientific name)	*Rough sketch*
Size and shape	
Colour pattern	
Habitat	
Food	
Nesting	
Behaviour	
Conservation status	