

<b>LESSON</b>	<b>Lesson 2: Bird Identification and Analysis</b>
<b>OBJECTIVE</b>	<b>Students will use Haikubox to identify local bird species and graph their annual distribution</b>
<b>OVERVIEW</b>	<ul style="list-style-type: none"><li>Investigation of local migrating bird species using real data for group presentations.</li></ul>

## STANDARDS

### Next Generation Science Standards

MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

### Florida Sunshine State Standards

SC.7.L.17.3 Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.

SC.912.L.17.5 Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

Key Vocabulary: bioacoustics, abiotic, biotic, habitat, ecosystem, population, species, community, competition, predator, prey, biodiversity, reproduction, rookery, nesting, migration, adaptation, limiting factor, carrying capacity

### Websites

All About Birds: <https://www.allaboutbirds.org/news/>

BirdCast: <https://birdcast.info/>

Argument-Driven Inquiry in Biology: <https://static.nsta.org/pdfs/BookBeat201509ClimateChangeAndBirdMigration.pdf>

## ACTIVITIES

### ENGAGE

- Show students a video of a local bird species that migrates that was found using BirdCast.

### EXPLORE

- Have students use BirdCast to look up migrating birds in the area.

### EXPLAIN

- Use All About Birds and eBird to create a short presentation on the species to use as an exemplar model for the students describing the species' habitat, food, nesting, behavior, etc.
  - Define and relate the vocabulary terms to the bird (ecosystem, population, species, community, competition, predator, prey, biodiversity, reproduction, rookery, nesting, migration, adaptation).
  - Click on the Daily Chart in the Haikubox showing the number detections. Add together the detections for each month in the last year and create a line or bar graph (x-axis month, y-axis number of detections). Use the graph to describe the migration patterns throughout the year.
- Review limiting factors and discuss what might influence the population of that bird species in the area.

### ELABORATE

- Have students work individually, in pairs, or groups to create a presentation on a migrating bird species in the area using the exemplar as a model.
- It is likely you will need to provide step by step instructions when students are creating the graphs.

### EVALUATE

- 3-2-1 Activity. Have students share 3 things they learned, 2 things that surprised them, and 1 thing they still want to know about their bird species.

### EXTENSION

- [Argument Driven Inquiry](#) Lab 13: *Environmental Influences on Animal Behavior: How Has Climate Change Affected Bird Migration?* Guiding Question: What impacts the species of birds present in your location? Student groups will create a research question and compare class data to previous months, years, or different Haikubox locations of their choice.
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