

Cultivating Curiosity: Birds at the Gardens

Students will be introduced to inland and coastal birds of Maine and their adaptations. Students will study bird calls and mnemonics to recall them. Through exploration and observation of two habitats, students will begin to think about biodiversity. Students will be introduced to scientific explanation.

Up to and including grade 5



Unit Overview: Students will be introduced to inland and coastal birds of Maine and their adaptations. Students will study bird calls and mnemonics to recall them. Through exploration and observation of two habitats, students will begin to think about biodiversity. Students will answer essential questions and be introduced to scientific explanation.

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Dear Teachers: Welcome to **Birds at the Gardens!** This unit was developed by the Education Department at Coastal Maine Botanical Gardens. Our goal is to provide a high quality, standards-aligned field trip in keeping with our mission inspire meaningful connections among people, plants, and nature through horticulture, education and research. It is designed for students up to and including grade 5 and can be modified by you, the teacher, to fit your curricular needs.

Before your visit: The pre-visit activities provided will enhance your field experience. Please use our visuals, vocabulary, and essential questions to begin your study of Birds at the Gardens. Expectations for written answers to the essential questions can be modified to meet the needs of learners. If you have a projector, project the visuals onto a screen and enlarge them for close study. To study bird calls before your visit, visit <http://macaulaylibrary.org>.

During your visit: Your students will listen and learn different bird sounds and talk about adaptations, habitats, and biodiversity. Then they will go into the field to collect data about birds in their habitats. When they return to the Education Center, they will review the essential questions once more and be introduced to scientific explanation (claim, evidence, reasoning).

After your visit: Back in your classroom, review the claims and if students need to revise their claims, allow them to do so. Please use the post-activities to review what they have learned. Further exploration of the topic is encouraged.

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Stage 1 - Desired Results

Established goals:

Core Idea LS1 **From Molecules to Organisms: Structures and Processes**

How do organisms live, grow, respond to their environment, and reproduce?

- **LS1.A: STRUCTURE AND FUNCTION**
How do the structures of organisms enable life's functions?
 - **By the end of grade 2.** All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive, grow, and produce more plants.
 - **By the end of grade 5.** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.
(Boundary: Stress at this grade level is on understanding the macroscale systems and their function, not microscopic processes.)

Core Idea LS4 **Biological Evolution: Unity and Diversity**

How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms? How does biodiversity affect humans?

- **LS4.C: ADAPTATION**
How does the environment influence populations of organisms over multiple generations?
 - **By the end of grade 2.** Living things can survive only where their needs are met. If some places are too hot or too cold or have too little water or food, plants and animals may not be able to live there.

- **By the end of grade 5.** Changes in an organism’s habitat are sometimes beneficial to it and sometimes harmful. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.
- **LS4.D: BIODIVERSITY AND HUMANS**
What is biodiversity, how do humans affect it, and how does it affect humans?
- **By the end of grade 2.** There are many different kinds of living things in any area, and they exist in different places on land and in water.
- **By the end of grade 5.** Scientists have identified and classified many plants and animals. Populations of organisms live in a variety of habitats, and change in those habitats affects the organisms living there. Humans, like all other organisms, obtain living and nonliving resources from their environments.

Source:

National Research Council. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. Washington, DC: The National Academies Press, 2012.

Understanding(s):

Students will understand that...

- Birds have parts that help them survive.
- Birds adapt to places where they can find food and shelter.
- Birds use sounds for many reasons.
- Birds share their space with other living things.

Essential Question(s):

- What parts help birds survive?
- What birds live at Coastal Maine Botanical Gardens and why?
- What sounds do birds make and why?
- What other plants or animals live where the birds live?

Students will know...

- Different parts of birds that help them survive.
- Habitats of birds that provide food and shelter.
- Sounds birds make and ways to remember them.
- What other things share space with the birds.

Students will be able to...

- Talk about adaptations of birds and identify some of these adaptations.
- Identify a forest and tidal river habitat.
- Make bird calls and identify bird calls in the field.
- Talk about the ecosystem of which birds are a part of by comparing two habitats.

Stage 2 - Assessment Evidence

Performance Tasks:

- *Learn the adaptations of birds and be able to describe some of them.*
- *Learn the bird calls of 6-8 birds and reproduce those sounds using mnemonic devices.*
- *Go on an exploratory walk in the Gardens, visiting the forest and tidal river habitats to count the number of different birds in each habitat. Make a claim and show evidence based on reasoning on which habitat has more birds and why.*

Other Evidence:

- *Vocabulary activities*
- *Oral/and or written responses to the Essential Question worksheet*
- *Bird calls work sheet*
- *Map of Gardens with observations of birds in two habitats*
- *Claim, evidence, reasoning worksheet*
- *Drawing of a bird and its parts*
- *Drawing of a bird in a habitat*

Stage 3 – Learning Plan

Learning Activities:

- Look at pictures of birds and discuss the adaptations of birds such as beaks, feathers, feet, hard-shelled eggs and hollow bones.
- Do vocabulary activities to learn the key vocabulary.
- Listen to bird sounds and use mnemonic devices to reproduce them.
- Go on an exploratory walk. Explore two different habitats. Listen for bird calls and try to identify birds in the field. Look at what other living things share the habitat.
- Return to the Education Center and look at the essential questions.
- Review the essential questions with the group.
- Draw a bird and label its parts.
- Create a unique bird call and say what it is used for. Teach others the call and practice it.
- Illustrate a sentence about a habitat.

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Grade Levels: Up to and including grade 5

How do we help young students with inquiry? How do we encourage curiosity? How can we help them to think like scientists? As you present the following essential questions to your class, it helps to help them frame their answers using the claim, evidence, reasoning approach. A **claim** is a statement of conclusion that answers the original question. **Evidence** is scientific data that supports the claim. The data needs to be appropriate or sufficient to support the claim. Students will then use **reasoning**, a justification that connects the evidence to the claim. It shows why the data counts as evidence by using appropriate and sufficient scientific principles. By using this vocabulary and modeling how to construct a scientific explanation, you are preparing young students for thinking critically about science. To begin your studies, use the vocabulary, show the visuals, and ask these questions.

Essential Question: What parts help birds survive?

Essential Question: What birds live at your school and why?

Essential Question: What sounds do birds make and why?

Essential Question: What other plants or animals live where the birds live?

Observations, Claims, Evidence & Reasoning Prompt

Name: _____ Date: _____

<p>Observations What did you observe? What information did you collect?</p>	
<p>Claim After looking for patterns in your observations, what inferences (claims) can you make that address the essential question?</p>	
<p>Evidence What observations support your claim?</p>	
<p>Reasoning What science big ideas help you connect the claim and evidence? How do your ideas compare with those of others?</p>	

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KEY VOCABULARY

1. Adaptations: changes that help things live
2. Feathers: only birds have feathers, and they are used to keep the bird warm, to help the bird fly, and to give the bird colors (sometimes they want to stand out and sometimes they want to blend in)
3. Beak: beaks are on the front of a bird's head and help birds look for food, eat, feed their babies, carry things, build things, open things, and clean their feathers
4. Bones: bird bones are very light to help them fly
5. Feet: bird feet help birds in different habitats, such as webbed feet for water birds, toes on more than one side to climb on branches, and feet that lock into place so that birds can sleep without falling over
6. Bird call: helps birds communicate with other birds in their family to tell location, to give a warning, or to scare enemies
7. Bird song: usually done by male birds to attract female birds, and usually only at certain times of the year
8. Biodiversity: the number and variety of living things found within a habitat
9. Habitat: the place where a plant or animal normally lives and grows

COASTAL MAINE
BOTANICAL
GARDENS

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Name: _____ Date: _____

I V L E Q Y B N B F O Q K E E
R S E N O B G I L Q Y G P W O
Q M C Y E F R R H I P L H K F
P O W E P D E P T A A X V I C
I S U L S Z D X J L B I S T J
O A O O S K A E B O S K H T H
L D N S N S U B M B V T X U V
K G K A D A P T A T I O N S S
A B H S V D I J T A T I B A H
Z L Y B O G O W T T M E G X N
O K F I X G M J O H O C E B E
E V Z F S R E H T A E F R F C
S B I R D C A L L I Q X D N I
M O F M L M T V K Y D D V Y T
A Y T I S R E V I D O I B F U

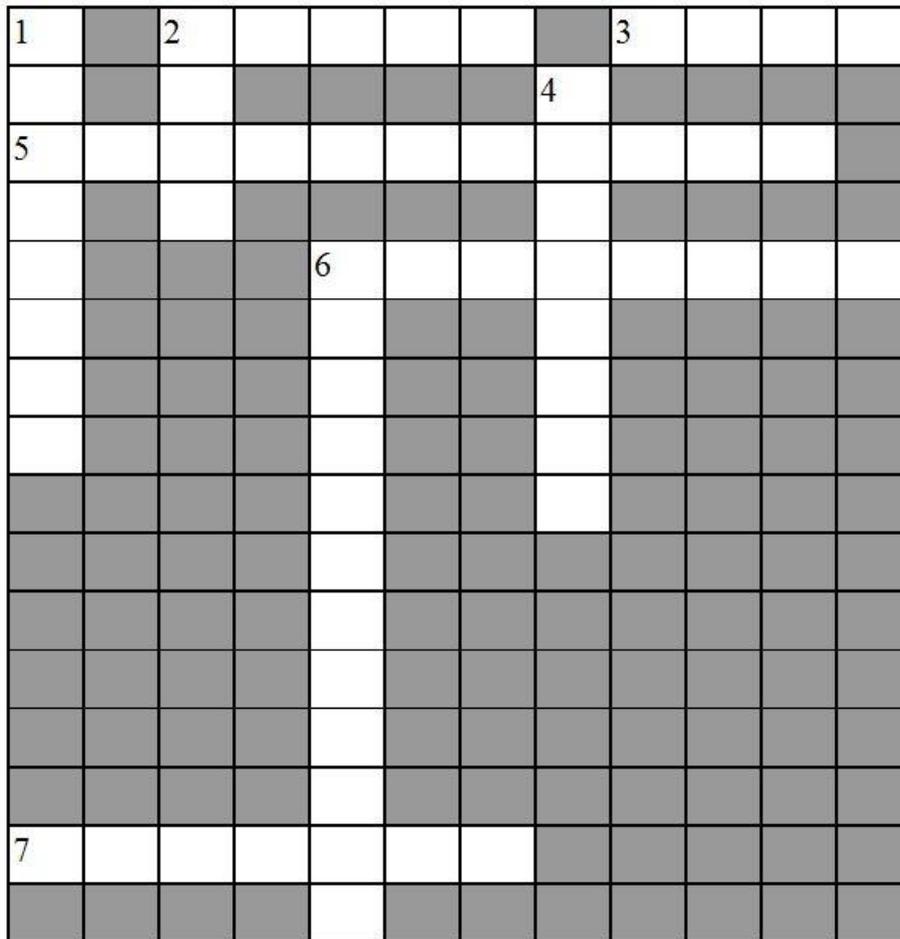
ADAPTATIONS
BEAKS
BIODIVERSITY
BIRDCALL
BIRDSONG
BONES
FEATHERS
FEET
HABITAT

COASTAL MAINE
 BOTANICAL
 GARDENS

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Name: _____ Date: _____



COASTAL MAINE
BOTANICAL
GARDENS 

Crossword Key:

ACROSS

2. these are very light to help birds fly
3. these help birds in different habitats, such as webbed for water birds, toes on more than one side to climb on branches, and those that lock into place so that birds can sleep without falling over
5. changes that help things live
6. usually done by male birds to attract female birds, and usually only at certain times of the year

DOWN

1. only birds have these, and they are used to keep the bird warm, help the bird fly, and give the bird colors (sometimes they want to stand out and sometimes they want to blend in)
2. this is on the front of a bird's head and help birds look for food, eat, feed their babies, carry things, build things, open things, and clean their feathers
4. helps birds communicate with other birds in their family to tell location, to give a warning, or to scare enemies
6. the number and variety of living things found within a habitat

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KEY IMAGES



Figure 1 Eastern Phoebe (M. Kainickara photo)

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KEY IMAGES



Figure 2 Song Sparrow (M. Kainickara photo)

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KEY IMAGES



Figure 3 American Goldfinch (M. Kainickara photo)

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KEY IMAGES



Figure 4 Mourning Dove (M. Kainickara photo)

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KEY IMAGES



Figure 5 Black-capped Chickadee (M. Kainickara photo)

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KEY IMAGES



Figure 6 Yellow Warbler (M. Kainickara photo)

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KEY IMAGES



Figure 7 Great Black-backed Gull (M. Kainickara photo)

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KEY IMAGES



Figure 8 Double-crested Cormorant (M. Kainickara photo)

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KEY IMAGES



Figure 9 Great Blue Heron (M. Krainickara photo)

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KEY IMAGES



Figure 10 Wood Ducks (M. Krainickara photo)

Birds at the Gardens
Post-visit Activity

Name: _____ Date: _____

Directions: Draw and label a bird and its parts. Use the vocabulary you have learned. You may use your imagination or draw a real bird. Answer the question based on your field studies at Coastal Maine Botanical Gardens.

Feathers
Beak
Bones
Feet

Habitat

What kind of habitat would your bird live in and why?

Birds at the Gardens
Post-visit Activity

Name: _____ Date: _____

Directions: Draw a picture to illustrate the sentences below.

A bird finds food in the forest.
The bird eats insects.

Birds at the Gardens
Post-visit Activity

Name: _____ Date: _____

Directions: Draw a picture to illustrate the sentences below.

A bird finds food in the water.
The bird eats fish.

Birds at the Gardens
Post-visit Activity

Name: _____ Date: _____

Directions:

Think about all the bird calls you have learned! Now it is time to create your own bird call. First, draw your unique bird!

Then, think about the type of call it will make. Is it to tell others birds its location? Is it a warning call? Is it a song to attract a special bird friend?

Practice your call and then teach it to your classmates. Tell them why it is used and show them your unique bird picture.

What words help you remember this bird's call?