



## Virtual Summer Camp: STEM Explorers

### Week 5—Birds, Beaks and Wings, Oh My!

This Week:

Learn how to identify local birds, play a migration game and more!

Friday-Monday: **Review & Prep!** Read through the packet and gather your materials.

Tuesday: **Tune in! Watch** our educators lead a live demonstration at 2pm.

Wednesday: **Experiment & Play!** Follow the activity instructions in your packet.

Thursday: **Share Your Results!** Submit a photo of your results to [education@hrpt.ny.gov](mailto:education@hrpt.ny.gov) to be featured on our website. Then, download next week's packet!

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Week 5— Birds, Beaks and Wings, Oh My!

### Materials Check List

#### Bird Migration Board Game:

- ☐ Bird Migration Game Board (in packet)
- ☐ Habitat Change Cards (in packet)
- ☐ Game Pieces (in packet)
- ☐ Paper & writing utensil to record points
- ☐ Dice (use your own or use this [digital dice program!](#))

#### Rocking Birds:

- ☐ Scotch tape or glue
- ☐ Paper Plate
- ☐ Markers/Paint
- ☐ Construction paper
- ☐ Feathers (optional)
- ☐ Googly eyes (optional)

#### Bird Watching with iNaturalist:

- ☐ Phone or Tablet with access to camera and WiFi
- ☐ iNaturalist app

OR

- ☐ Camera
- ☐ Access to [iNaturalist.org](https://www.inaturalist.org)



# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Bird Watching with iNaturalist

**Theme:** Birds, Adaptation, Habitat

**Ages:** 9-14 years old

**Prep Time:** None

**Activity Time:** Varies

### Activity Summary:

Hudson River Park provides important habitat to a wide variety of local and migrating bird species. Some of the bird species you can spot in the Park include Canada geese, red tailed hawks, rock doves, mallard ducks, northern flicker woodpeckers and song sparrows, just to name a few. There are over 100 species of birds that fly through the park every year, so it is a big job trying to keep track of them all and in this lesson, we're asking for your help! In this experiment students will observe bird species from their backyard or the Park! Using the free iNaturalist application, students will report their observations by taking photos or recording a sound and then uploading their observations to the app!

### Objectives:

- Students will identify native bird species
- Students will learn how to operate the iNaturalist app to survey wildlife

### Lesson Materials:

- HRP Basic Bird Field Guide
- Bird Tracking Chart Worksheet

### Experiment Materials:

- Phone or Tablet with access to camera and WiFi (to download iNaturalist app)
- iNaturalist app
- OR
- Camera
- Access to [iNaturalist.org](https://www.inaturalist.org)

### 1- Background: iNaturalist

iNaturalist is a free social media platform of individuals sharing images of wildlife and plants to help others learn more about nature and biodiversity. It is also used as a tracking/recording tool to observe organism occurrence and as a crowdsourced species identification system. Anyone can participate as long as they have a phone or tablet with access to a camera and WiFi, either from the park, your neighborhood or your own backyard! You can also make observations and take pictures outdoors, and upload your photos to the iNaturalist website later.

**Note to Educator:** *Students are recommended to receive parental permission before creating an iNaturalist account as it is a social media platform.*

### 2- Migration & Bird species in Hudson River Park:

Hudson River Park is a biodiverse ecosystem home to over 100 species of birds that are local or migrate seasonally! Hudson River Park is located in the east coast of North America and as we experience the changing of seasons, birds and other animals migrate to warmer areas. Birds typically migrate from areas of low or decreasing resources, like food and shelter, to areas of increasing resources. When the colder seasons approach, like autumn and winter, there is limited availability of insects and seeds to eat, and birds migrate down south for easier access to these resources.

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Before you go out and explore, you need to learn how to properly ID (identify) some bird species that you might find. Properly identifying bird species is important and aids in understanding what type of habitat Hudson River Park provides for these migratory birds. Visual identification is *essential* for many bird watchers. Bird watchers often use four distinct categories to visually ID a bird species. The 4 keys to visually ID a bird include: *size and shape*, *color pattern*, *behavior* and *habitat*.

Below are six common bird species you might spot in the NYC, NJ or HRP area:

Common name: [Canada Goose](#)

Scientific name: *Branta canadensis*



**Size & Shape:** Water bird with long neck, large body frame, large webbed feet and wide, flat bill.

**Color Pattern:** Black head, white cheeks, white chinstrap, black neck, tan breast and brown back.

**Behavior:** Often seen moving in pairs or flocks in a V formation. Canada Geese feed by dabbling in water or grazing in fields.

**Habitat:** Lakes, rivers, ponds, small or large bodies of water, park lawns and farm fields.

Common name: [Rock Pigeon](#)

Scientific name: *Columbia livia*

**Size & Shape:** Tubby bird with small head and short legs. Rock pigeons are typically larger than Mourning Doves. Wings are broad and pointed. Tail is wide and rounded.

**Color Pattern:** Varies. Most birds are a blue/gray color with two black bands on the wing and a black tip to the tail. May have iridescent throat feathers. Wing patterns vary from two bars, dark spots or plain. Tail may have a dark tip.

**Behavior:** Typically found gathered in flocks, walking or running, and pecking for food. Flock flies into the air when alarmed and circles around a few times before returning back down.

**Habitat:** Typically found all throughout cities, just like NYC, and towns. Can also be spotted in farmlands, fields, or rocky cliffs.



Common name: [Mourning Dove](#)

Scientific name: *Zenaida macroura*



**Size & Shape:** Plump body with long tail, short legs and short bill. Head size is small in comparison to body size.

**Color Pattern:** Brown to tan overall with black spots on wings and black bordered white tips all the way to the tail feathers.

**Behavior:** Seen flying fast on powerful wingbeats. Sometimes seen making sudden ascents and descent with their tails stretched out behind them.

**Habitat:** Found anywhere except deep woods. Can be spotted in fields or patches on the bare ground or up on telephone wires.

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Common name: [Northern Cardinal](#)  
Scientific name: *Cardinalis cardinalis*



**Size & Shape:** Fairly large, long-tailed songbird with a short but thick bill and a notable crest.

**Color Pattern:** Male cardinals (pictured left) are bright red all over, with a red bill and black face around the bill. Females are pale brown overall with warm red tinges on the crest, wings, and tails. Females have a red-orange bill with a black face surrounding the bill.

**Behavior:** Northern Cardinals are found in pairs sitting low in shrubs, trees or near ground. Oftentimes found sitting with a hunched-over posture and tail pointed down. Cardinals have a loud metallic chip note.

**Habitat:** Northern Cardinals can be found in areas like backyards, parks and shrubby forest edges. Nests are found in dense tangles of shrubs and vines.

Common name: [Mallard](#)  
Scientific name: *Anas platyrhynchos*

**Size & Shape:** Large, hefty and long body, round head with wide flat bill. In water, the tail rides high out of water giving the Mallard a blunt shape. In flight, the wings are broad and set towards the rear.

**Color Pattern:** Male Mallards have a dark, iridescent green head and a bright yellow bill. Brown breast, black rear with a gray body. Females and juveniles are brown with orange-brown bills. Both sexes have a white-blue bordered speculum patch in the wing.

**Behavior:** Most commonly known as “dabbling ducks” due to their feeding patterns in water by tipping forward and grazing underwater plants. Often found in groups with Mallards or different species of dabbling ducks.

**Habitat:** Found in wetland habitats that are natural or artificial. Also seen in lakes, ponds, rivers, marshes and coastal habitats. Abundant in cities, like NYC, suburban parks and backyards.



Common name: [American Robin](#)  
Scientific name: *Turdus migratorius*



**Size & Shape:** Fairly large songbird with round body, long legs and fairly long tail.

**Color Pattern:** Gray-brown birds with warm, vibrant orange underparts, dark brown heads and a white patch located on the lower belly. In comparison to males, females have paler heads that contrast less with the gray back.

**Behavior:** Robins stand erect with beaks tilted upward. When descending, they flick their tails downward several times. In winter months they form large flocks and gather in trees to eat berries. In spring and summer months, they can be seen hopping on the ground and pecking for worms and insects.

**Habitat:** Parks, yards, gardens, fields, pastures, tundras, woodlands, pine forests and shrublands.

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Lesson Procedure:

*Educator Note: Refer to the HRP Basic Bird Field Guide to help identify common bird species within the park area. Feel free to use other guides to help ID any other birds you may come across. It's best to download the iNaturalist application before going out! Remember to wear a mask, be aware of your surroundings and other people, and wash your hands!*

Are you ready to be an explorer in Hudson River Park or from your backyard? In this lesson, we ask you to go out and explore the Park, or your backyard, for some birds that may be around. Some bird species you will likely spot are rock doves, mallard ducks, northern flicker woodpeckers, song sparrows and Canada geese! Using the iNaturalist app you have downloaded on your handheld device you will go outdoors and take your own pictures of nature and upload the observations for everyone else to see! To get an idea of some of the species that reside within the park check out the [Hudson River Water Project hashtag](#) and check out some of the marine species that reside in the [Hudson River Estuary](#). Also, share your findings in [Hudson River Park's](#) Bioblitz page every month!

The goal for this lesson is try and observe as many different bird species you can spot. Use the HRP Bird Field Guide as a reference to help identify bird species when uploading your observations to iNaturalist. iNaturalist also suggests species IDs based on the photos you upload. Then track the number of observations you collect in the Bird Tracking Chart Worksheet. Make sure to practice required social distancing measures, wear your mask and most importantly make sure to have fun and be safe!

Important things to keep in mind when making observations:

When making observations, be sure to:

- Take identifiable photos, such that they are not blurry.
- Take multiple photos at different angles
- Focus on wildlife, specifically bird species





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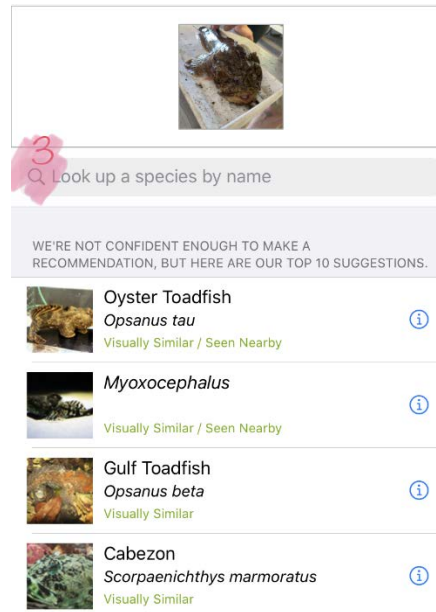
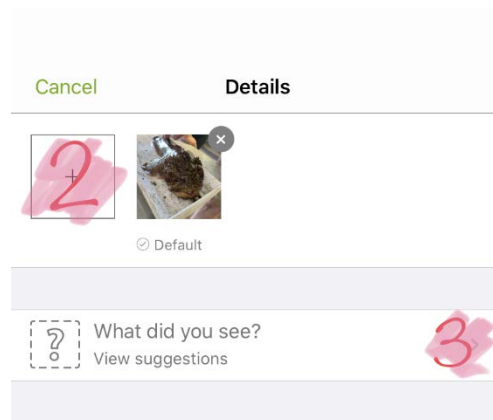
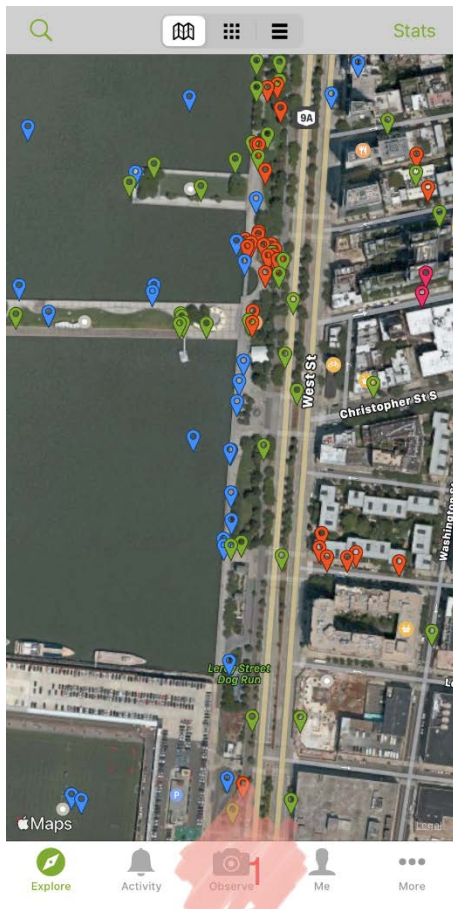
## Getting Started: How to Make an Observation on your Phone

iNaturalist is an application for posting ***your own photos*** from nature. We ask that you make sure to not to use photos from the web.

**Step 1:** Once the iNaturalist app is open you should see a screen with a map of where you are and on the bottom you will see a small camera that says observe. Begin by tapping **observe**.

**Step 2:** Upload your photo(s). More than 3 images at various angles is preferred.

**Step 3:** Choose what you observed. *You can choose from the suggested species iNaturalist will recommend.*

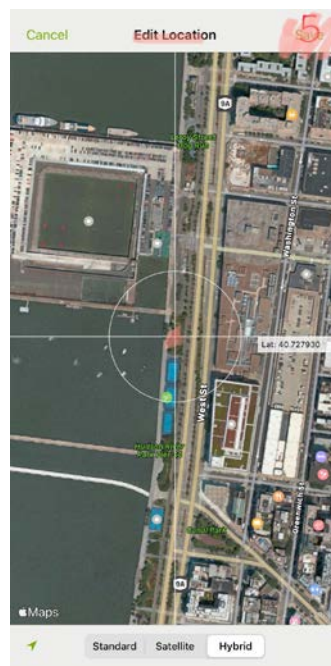
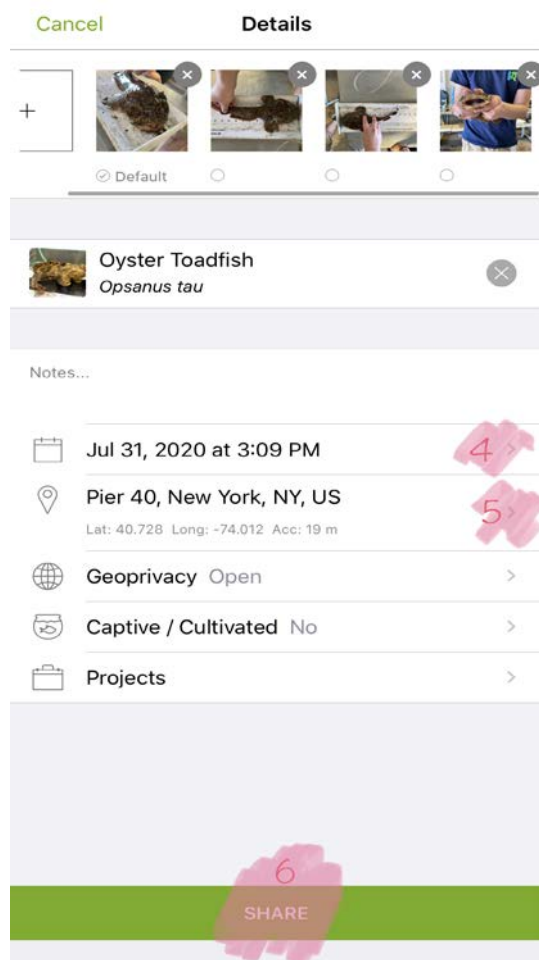


# VIRTUAL SUMMER CAMP: STEM EXPLORERS

**Step 4:** The date you took pictures of your observation should automatically appear.

**Step 5:** The location of where you saw your observations should automatically appear. (If app was unable to fetch location, go to the Settings → Privacy → Enable Location services for iNaturalist) An alternative is to edit the location and pinpoint the location manually (see right image).

**Step 6:** Save your observation!

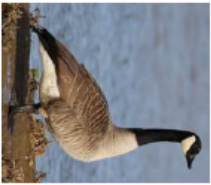


For more help on making observations from other devices check out the [iNaturalist Getting Started](#) page!



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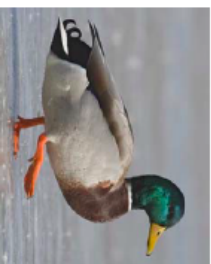
## Hudson River Park: Bird Field Guide



Canada Goose



Ring-billed Gull



Mallard



Double-crested  
Cormorant



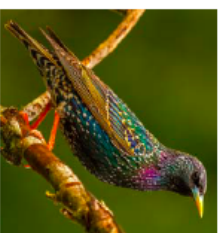
Sparrow



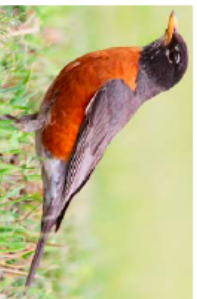
Rock Pigeon



Mourning Dove



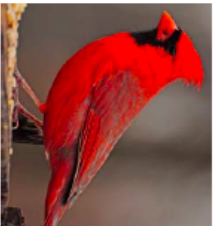
European Starling



American Robin



Black-capped  
Chickadee



Northern Cardinal



Northern  
Mockingbird

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Bird Tracking Chart Worksheet

Use the chart below to track the number of each species you have spotted/observed. The second chart can be used to track other bird species you may have found.

**Chart 1: Common Bird Species in HRPK**

# of Canada Geese Observed: _____	# of Ring-billed Gulls Observed: _____	# of Mallards Observed: _____	# of Double-crested Cormorants Observed: _____
# of Sparrows Observed: _____	# of Rock Pigeons Observed: _____	# of Mourning Doves Observed: _____	# of European Starlings Observed: _____
# of American Robins Observed: _____	# of Black-capped Chickadees Observed: _____	# of Northern Cardinals Observed: _____	# of Northern Mockingbirds Observed: _____

Total number of species observed: \_\_\_\_\_

Most common species observed: \_\_\_\_\_

Least common species observed: \_\_\_\_\_

**Chart 2: Bird Species Found in Other Locations**

Species name: _____	Species name: _____	Species name: _____	Species name: _____
# of Species Observed: _____	# of Species Observed: _____	# of Species Observed: _____	# of Species Observed: _____
Species name: _____	Species name: _____	Species name: _____	Species name: _____
# of Species Observed: _____	# of Species Observed: _____	# of Species Observed: _____	# of Species Observed: _____

Total number of species observed: \_\_\_\_\_

Most common species observed: \_\_\_\_\_

Least common species observed: \_\_\_\_\_

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Bird Anatomy: Rocking Bird

**Theme:** Hudson River Wildlife; Form and Function

**Ages:** 5-8

**Prep Time:** 5 minutes

**Activity Time:** 20-30 minutes

### Activity Summary:

This lesson teaches students to identify the physical features that define birds. By discussing the function of each feature, students explore the significance of each part. This lesson breaks down basic bird anatomy while also teaching how bird beak features influence feeding habits. This lesson allows students to create a craft representation of a Hudson River Park animal considering shapes and colors of the actual animals.

### Objectives:

- Students will learn the basic anatomy of a bird and the function of each part through an interactive craft
- Students will learn about the behavior and habitat of Hudson River Park animals

### Materials:

- Bird Anatomy Diagram
- Scotch tape or glue
- Paper Plate
- Markers/Paint
- Construction paper
- Feathers (optional)
- Googly eyes (optional)

### Introduction:

Identifying different types of birds can come pretty easy when you know what to look for, and the best place to start is learning the anatomy of a bird. Birds share all the same basic body parts, but they will look different for different species. These differences will also change how a bird acts. Just take a look at the images below:



American Kestrel



Yellow-bellied sapsucker



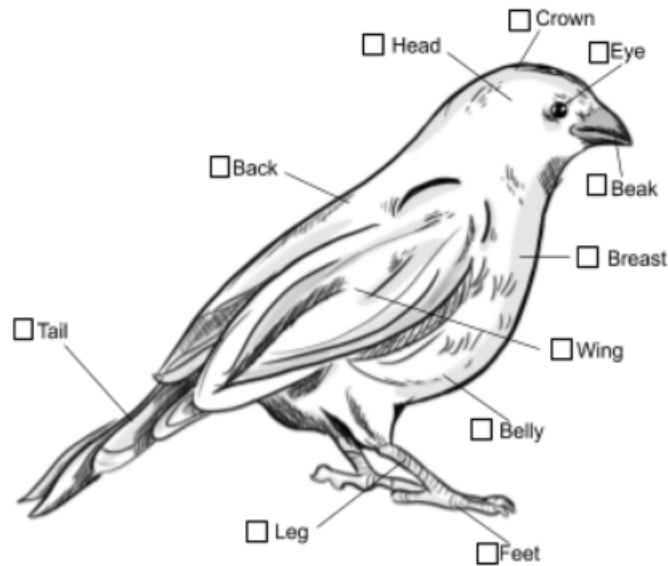
Common tern

It's clear that these photos are all of birds, but why? Can you think of three features that let you know these are birds? (Hint: Think about body parts that humans don't have.)

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## Lesson Procedure:

Things like feathers, wings, and beaks make it very clear that these are birds and not, say, dogs or people! Review the diagram below that shows all the basic parts of a bird, and then follow the instructions to create a bird of your own, using a paper plate, markers, construction paper, and whatever other materials you would like to use.



## Instructions

1. Fold your paper plate in half to create the body of your bird.
2. Use markers, crayons, feathers, bits of construction paper, glue, tape and whatever else you would like to add the different body parts of a bird (shown above) to your plate. You can draw legs and feet directly on your plate, or attach other materials to create them.
3. Check off the boxes next to each body part in the diagram above to make sure you haven't forgotten any important parts. Bonus: Label the different parts of your bird.
4. Let any glue or wet ink dry.
5. Slightly unfold your plate, so your bird can stand up. If you've attached legs, it may be a little tricky to balance. If you've drawn legs, you can rock your bird back and forth along the round edge to mimic pecking!
6. Name your bird. Many birds are named for the parts of their body that set them apart from other species, like the yellow-bellied sapsucker or the scarlet tanager. What parts of your bird make it unique?



Scarlet tanager, photographed by  
Park Naturalist, Keith Michael

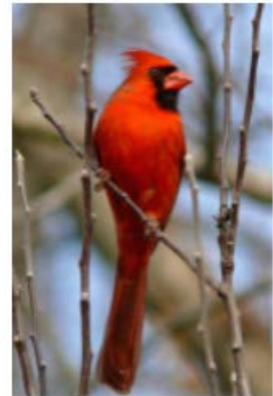
# VIRTUAL SUMMER CAMP: STEM EXPLORERS

Here's an example of what a rocking bird craft could look like.



7. **Optional:** review more information about the form and function of birds below:

- **Eyes:** Just like in humans and other animals, eyes help birds to see. They can find food, shelter, and know when to fly away from predators with use of their eyes. Birds' eyes can be large or small depending on the species. Large eyes often are found in birds that hunt at night, because they are able to absorb more light.
- **Crown:** The crown is the very top part of a bird's head. It is usually referred to when talking about notable feathers or colors in the area that can help identify the bird. Some birds, like the northern cardinal, have a crest in this area as if it is wearing a funky hat. This is an adaptation that helps certain birds seem attractive to potential mates.
- **Head:** You can often see birds moving their heads at strange angles and bobbing them around, some birds can even turn their heads almost all the way around to face backwards. This is because birds' eyes are far apart from each other. Quick and seemingly awkward head movements help birds get a better view of their surroundings.
- **Beak:** Bird beaks are strong and come in many different shapes and sizes. These differences correspond to what they eat. The northern cardinal has a short thick beak to help it eat lots of fruits and seeds. American kestrels have sharp hooked beaks to help them eat insects and small animals like mice.
- **Back:** The back of a bird is less often discussed. There are super strong muscles in the back of birds that are important to help them stay in the air and soar once they've taken flight.
- **Breast:** This area is often colorful and held proud by birds as a display when they are ready to mate. It is a very strong area because these muscles help birds flap their wings and take flight, that takes a lot of power!



Northern cardinal



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- **Wings:** Wings enable birds to fly. Birds like the albatross have extra long wings to help them soar long distances, whereas penguins have paddle-like wings that are better for swimming.
- **Belly:** Bird bellies are often covered in smaller, slightly fluffier feathers that help keep birds warm. They can be colorful to help them stand out to potential mates, or subdued to help them blend in with their surroundings.
- **Legs:** While most birds fly when traveling longer distances, birds' legs are still important for helping them walk, hop, and run toward food or away from predators. Some birds, like the great egret, have long legs that help them stand at the water's edge while they hunt for fish to eat.
- **Feet:** Birds' feet allow them to walk and run, some, like the American kestrel, have strong talons (or claws) to help them grab prey when they are hunting. Others, like mallard ducks, have webbed feet to help them paddle through water and swim.
- **Tail:** The tail is used in flight to help birds stay balanced and control the height of their soaring. This area is sometimes covered by decorative feathers attached to the birds lower back to help them attract a mate.



Northern royal albatross



Emperor penguin



Great egret



Mallard ducks, photographed by Park Naturalist, Keith Michael

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

## Bird Migration Board Game Rules

**Theme:** Birds, Migration, Habitat, Conservation

**Ages:** 10-14 years old

**Prep Time:** 10 Minutes

**Activity Time:** 15-20 minutes

**Activity Summary:** In this activity, you will play a game in which you take on the role of a bird as it migrates to its northern and southern habitats. As you may know from previous activities, **migrations** are seasonal movements of animals from one place to another. Many types of animals, including birds, fish and even butterflies complete important migrations every year in order to seek out ideal habitat conditions and take advantage of different food sources.

### Objectives:

- Students will take on the role of a migratory bird species and complete a migration cycle board game
- Students will learn how changes in habitats caused by human activity can negatively impact migratory species

### Lesson Materials:

- Bird Migration Game Board (in packet)
- Habitat Change Cards (in packet)
- Game Pieces (in packet)
- Paper/notebook to record points
- Dice (use your own or use this [digital dice program](#)!)

### Background

Successful migrations are important to the survival of many species, but they aren't easy. Birds like the American Robin travel an average of 38 miles per day when they migrate! Can you imagine how much energy it would take for you to run 38 miles in a single day? Because they use lots of energy to fly from place to place, **stopover habitats**, habitats where migratory species can rest and eat to replenish their energy, are important to the survival of migratory species. Stopover habitats can come in all shapes and sizes, from natural forests and lakes to urban parks and gardens.

Stopover habitats can be dramatically affected by human activities in positive and negative ways. For example, if a town decides to cut down an area of forest to develop into a mall, then they are removing potential stopover habitat where migratory species can rest. On the other hand, if a town decides to restore natural shorelines by replanting native vegetation, they are recreating stopover habitat that once existed there naturally.

### Game Setup

# VIRTUAL SUMMER CAMP: STEM EXPLORERS

- In this game, you will take on the role of a bird species as it migrates between its northern and southern habitats. The Northern and Southern habitats are marked by spaces on either end of the board. Print out the board and other game pieces and place them on the table. Cut out game pieces and habitat change cards. Place game pieces at the start of the board (Northern Habitat). Assemble Habitat Change Cards into a deck and shuffle them.
- **Green spaces** on the game board represent various types of stopover habitat. If you land on a green space, **add the number of points listed on the space to your score!**
- **Red spaces** represent areas without stopover habitat. If you land on a red space, **subtract the number of points on the space from your score!**
- **Habitat Change Spaces:** If you land on a Habitat Change space on the board, draw the number of cards listed on the space from the deck of Habitat Change Cards. Follow the instructions on these cards, then continue playing normally.

## Rules

- At the start of your turn, roll a six sided die to see how many spaces forward your bird will move on its migration
- Depending on the type of space you land on, add/remove points from your score, or draw your habitat change cards. Once finished, pass the dice to the next player.
- Make sure to use a piece of paper to keep track of how many points you have!
- Remember, once you reach the Southern Habitat, you will need to turn around and start heading back to the Northern Habitat to complete your migration! Be careful though, some of the habitats may have changed!
- The game ends when all players have completed a full migration (North to South and back to North!). The winner is the player that has gained the most migration points along their journey!

## Post-game Wrap Up

Good job completing your migration! During this game, you might have seen how hard migrations can be for bird species, especially when human activities negatively impact their **stopover habitats!** Even though migratory bird species may visit a habitat for a few days out of the year, the health of these habitats are critical to making sure that birds can get the resources and rest that they need!