



MIGRATION PATTERNS

This lesson plan was created by Kate Studey as part of the Acadia Teacher Fellows (ATF) program. ATFs created lesson plans are created by educators for educators. Any books or links suggested in this curriculum are not an endorsement by the National Park Service.

Grade Span	6-8
Time Span	45-60 minute class period
Standards	<p>NGSS Science: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (MS-LS2-4)</p> <p>Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. (MS-LS4-6)</p> <p>AzSS (Arizona): Develop and use a model to explain how natural selection may lead to increases and decreases of specific traits in populations over time. (8.L4U1.11)</p>
Focus Question	<ul style="list-style-type: none"> • What migratory bird patterns are present in our region?
Overview	To engage students in the process of data analysis, looking at maps of migration patterns to identify which birds migrate through the area and which do not.
Objectives	<ul style="list-style-type: none"> • Define migration. • Identify migratory birds in the region and time of year (season) when most migration takes place.
Materials Needed	<ul style="list-style-type: none"> • Binoculars • Local Bird ID guide and/or Merlin ID app • Bird ID data sheet – teacher/student created or pre-made form • Clipboard • (Optional) eBird app on mobile device (phone, iPad, etc) – used to complete a bird checklist
Vocabulary	<p>Migration: Migration is the movement of animals from one region to another.</p> <p>Diet: What an animal eats.</p>
Teacher Prep	<ul style="list-style-type: none"> • Become familiar with common birds in the area students will most likely be identifying. eBird is a helpful tool for this. Visit this site for tips on beginning birding with students. • Check the weather before preparing to go outside. Have a backup plan in the case of inclement weather. • (Optional) Reach out to local Audubon Society or other organization to see about providing volunteers to help with bird walk. (Audubon Near You)



<p>Background</p>	<p>Many birds migrate in response to seasonal changes throughout the year. Depending on the species and availability of resources, birds may be found in an area all year long or they may only be there for part of the year. Birds How and Why Did Bird Migration Evolve Connections: Great Migrations, Part 1</p>
<p>Procedure</p>	<p>Engage:</p> <ol style="list-style-type: none"> 1. Introduce activity to students: bird walk & observation <ul style="list-style-type: none"> ● Review how to use binoculars. ● Set expectations for outdoor volume. ● (Optional) Set up mobile device with Merlin ID and eBird ● Review SMASH (Size, Markings, Activity, Sound, Habitat) with photos of bird and habitat ● Model how to use data sheet 2. Take students on a short (15-20 minute) bird walk around campus or in a nearby area. 3. Students take notes on the Bird Observation Data Sheet identifying birds that are seen. Utilize field guides, Merlin ID or other local resources to help with bird identification. <ul style="list-style-type: none"> ● Students can use SMASH to help them with identification 4. Students should also be paying attention to bird behavior on the walk. Are the birds nesting, feeding, perching, flying, etc.? 5. Either outside or back in the classroom, discuss observations and data collected. Students complete the Bird Observation Data Sheet Reflection <ul style="list-style-type: none"> ● Which birds were the most common? ● Where were most birds found? ● What do you think the diet is of the birds we observed? ● Do you think these birds are here all year round or just part of the year? <p>Explore:</p> <p>Note: Students may do this activity on individual devices, but model exploring one or two maps for students first.</p> <ol style="list-style-type: none"> 1. Go to eBird's Abundance Maps (see this quick guide with screenshots on how to filter and select weekly abundance: eBird Abundance Map Guide) 2. Click on <u>Filter</u> and type in state or county name in <u>Region name</u> field 3. Explore the list of birds and click on one that is found in your area or that you saw on your bird walk. 4. Select <u>Weekly</u> on the abundance map. This will give you a map with animation that shows the weekly locations of that species based on eBird data submitted. <p>Note: Depending on data available and whether a bird is migratory or not, a weekly abundance map may not be</p>



	<p>available. Focus on maps with animation that indicates migration, but also have them look at static maps by comparison (non-migratory).</p> <ol style="list-style-type: none"> Click the play button to see animated abundance by week. Students can work in pairs to review maps together. Discuss with students what they notice. Possible observations: <ul style="list-style-type: none"> Map key (yellow is less abundant, purple is more abundant) Some species move (migrate) while others don't Some species are in our area all year, but others pass through Have students pick four common birds from the area and complete Abundance Map Reflection. <p>Explanation:</p> <ol style="list-style-type: none"> Students read "The Basics of Bird Migration: How, Why, and Where" Discuss differences between the different types of migration. Students define each on Migration Types. What are some examples from our area? Here are some common examples: <ol style="list-style-type: none"> Warblers - migratory Northern cardinals – non-migratory Review abundance maps on eBird for local birds and discuss which ones fit into each category (permanent, short, medium, or long distance) <p>Extension:</p> <ul style="list-style-type: none"> Conduct frequent bird walks to make note of changes in bird populations in your area. Use eBird to submit checklists. Invite an ornithologist, Audubon Society member, or other scientist in the field to your classroom as a guest speaker. Participate in the Cornell Lab of Ornithology's Project Feederwatch, Great Backyard Bird Count, or other bird-related citizen science project. Students can create a field guide for the school campus based on frequently observed birds. Students research challenges to migratory birds and create an awareness campaign for the school or local community.
<p>Wrap-Up</p>	<p>Evaluate:</p> <ol style="list-style-type: none"> In your own words, explain what migration is. Give an example of a bird from our area that migrates. Use the eBird abundance map to determine if it is a short-, medium-, or long-distance migrant. Explain, in your own words, what type it is and how you know that.





S.M.A.S.H.

(Common yellowthroat)

Size	Sparrow or smaller
Marking	Black face, yellow belly, olive green back
Activity	Perching
Sound	*skip
Habitat	Forest (near a lake)

*Bird sounds can be difficult for new birders to identify.





S.M.A.S.H.

(Mallard duck)

Size	Between crow and goose
Marking	L: brown with stripes/spots R: gray body, blue/green head, yellow beak
Activity	Swimming
Sound	*skip
Habitat	Lake/Marsh surrounded by trees

*Bird sounds can be difficult for new birders to identify.



Bird Observation Data Sheet

Species	Number Seen	Behaviors Observed



Species not known: describe size, markings, activity, sound, or habitat (SMASH).



Bird Observation Data Sheet (EXAMPLE)

Species	Number Seen	Behaviors Observed
House Sparrow	5	Hopping on ground, picking at grass
Gray bird, smaller than crow	1	Standing/walking on roof
Hummingbird	1	Flying around pink flowers, hovering, feeding from hummingbird feeder



Species not known: describe size, markings, activity, sound, or habitat (SMASH).



Bird Observation Data Sheet Reflection

Which birds were the most common?

Where were most birds found? (trees, ground, rooftops)

What do you think the diet is of the birds we observed? (bugs, berries, nectar)

Do you think these birds are here all year round or just part of the year?



Abundance Map Reflection

Species	Migrating (Y/N)	Time of Year Present in Our Area
<i>Example: House Sparrow</i>	<i>N</i>	<i>All Year</i>
<i>Example: Yellow-rumped Warbler</i>	<i>Y</i>	<i>September - May</i>

Types of Migration

Permanent residents:

Example:

Short-distance migrants:

Example:

Medium-distance migrants:

Example:

Long-distance migrants:

Example: