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All About Birds

Goals: Strengthen a connection with nature, increasing an understanding of and appreciation for nature through a love of birds. Introduce citizen science to promote stewardship for local natural resources and wildlife.

Science | Literacy | Writing | Art

Grades K-5

Created By:
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Curriculum Set: All About Birds

Lesson 1: Beginning Birding

Goals: Identify birds by their calls and learn about common backyard birds.
Understand why nature journaling is important.

Science | Literacy | Writing | Art

Grade K-5

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Performance Standards

Environmental Education: A4.1, A4.2,

Total lesson time: 45 min

Introduction to Birds: 20 minutes

Bird Call BINGO: 20 minutes

Journaling: 5 minutes

Materials needed:

Have You Heard the Nesting Bird by Kenard Pak

Science Journals

Bird Coloring Sheets

Madison Audubon Bird Guide for Kids

Computer


Bird Call BINGO sheets and pieces

Lesson Tips:

- You can purchase *Madison Audubon Bird Guide for Kids* (donation of \$5/book) which includes 27 of the more common birds in south central Wisconsin. This book's simpler format includes fun facts and large pictures.

Introduction to Birds: Choose one (20 minutes)

1. Story Time and Bird Coloring Sheets (recommended for Grades K-2)
 - a. Read *Have You Heard the Nesting Bird* by Kenard Pak
 - b. Hand out Bird Coloring Sheets (found under the Education Resources tab on MAS website)
 - i. Review the different types of birds in the book.
 - ii. Show kids how to identify some of the birds in the *Madison Audubon Bird Guide for Kids* and read the fun facts.
 - iii. Give the kids time to color.
2. Science Journals (recommended for Grades 3-5)
 - a. Explain that scientists record their observations in journals. We are also scientists and will keep track of what we learn and see.
 - b. Why keep a science journal? Helps to answer how, what, and why questions.
 - c. How should you record your findings? Lists, captioned drawings, prose or poetry, tables, etc.
 - d. Show students how to create and decorate their own nature journal. We used this [site's](#) design when we made science journals for middle



school students. For younger students, we just stapled sheets of blank paper between cardstock covers and let them collage the front and back with nature magazines.

Bird Call BINGO: (20 minutes)

1. Tell the group we are going to go birding at the next session. Why is it called birding and not birdwatching? (Sometimes you can hear a bird and identify it by its call/song, but you cannot see the bird.)
2. We are going to practice birding by ear.
3. Hand out the bird call BINGO boards and bird sheets. Ask the kids to cut out the bird pieces and arrange however they would like on their board. Kids might have extra bird pieces. Put these to the side.
4. Play a bird call. Ask the kids to listen to the entire bird call quietly. Then ask the kids what bird they think it is. Help the kids answer what bird made the call. If a child has that bird, flip it over on their board so the piece is blank side up.
5. When a kid has four pieces flipped in a row vertically or horizontally, they can call out BIRDO!

Journaling: (10 minutes)

6. Everyone writes about their favorite bird and why they like it.
7. For grades K-2, use a larger group journal that everyone contributes towards. Hand out slips of paper for students to write their name and favorite bird. Paste the slips in the book.
8. Model effective journaling by recording your own favorite bird and sharing with the students.
9. If a student is unsure what to write, let them look at a bird field guide for suggestions.



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Curriculum Set: All About Birds

Lesson 2: Ornithology

Goals: Students learn how to use binoculars, identify birds by sight, and use a field guide.

Science | Literacy | Writing

Grade K-5

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Total lesson time: 1 hour 10 minutes

What is Ornithology: 20 minutes

Birding: 30 minutes

Journaling and Debrief: 20 minutes

Materials needed:

The Birdwatchers by Simon James

[Trivia questions](#)

Binoculars (optional)

Bird field guide

Science journals

Lesson Tips:

- You can check out bird field guides at most libraries. You can also use *Madison Audubon's Bird Guides for Kids* (donation of \$5/book) which includes 27 of the more common birds in south central Wisconsin. This book's simpler format includes fun facts and large pictures.


What is Ornithology: Pick one activity below (20 minutes)

- Read *The Birdwatchers* by Simon James (recommended for grade K-2)
 - Define ornithology
 - Why study birds?
 - Determine the health of bird populations (and the populations of plant and animal species affected by bird numbers, like prey and predators).
 - Understand ecosystem health. It can sometimes be determined with the help of bird health data.
 - What makes a bird a bird?
 - Covered in feathers (what are feathers used for?)
 - Warm blooded (regulate their own body heat, outside temperature doesn't control their body temperature)
 - Birds lay eggs
 - Ask kids to each write an example on the board of how they can tell different birds apart (recommended for grade 3-5)
 - Review answers and discuss other potential answers to identify different bird species.
 - Define ornithology?
 - Why study birds?

Play bird trivia (recommended for grade 3-5)

Birding: (30 minutes)

- Binocular basics

- 
- a. Ask the kids what tools ornithologists use to study birds.
 - b. Show kids how to focus binoculars. Remind kids to look for the bird first with their naked eye (sans binoculars) and then, keeping their eyes on the bird, bring the binoculars up to their face.
 - c. Reinforce the two binocular rules: strap stays around their neck and never walk with binoculars up to their face.
4. Take a nature walk stopping periodically to look and listen for birds. Use the bird guide to identify bird sightings.
 5. Lead the kids asking how, what, and why questions about birds:
 - a. What makes a bird a bird?
 - b. How do we identify the different birds?
 - i. Field marks, size, calls, color
 - c. Why do birds live where they live?

Journaling and Debrief: (20 minutes)

6. Debrief
 - a. Discuss ways that we can all help birds.
7. Science Journaling
 - a. Everyone writes the date, time, location, and weather.
 - b. Everyone takes time to write/draw what they learned about their surroundings, questions they have, or what they saw on their hike.
 - c. For grade K-2, use a larger group journal that everyone contributes towards. Hand out slips of paper for students to write their name and favorite thing they saw that day. Paste the slips in the book.
 - d. Model effective journaling by recording your own observations and sharing with the students.
 - e. If a student is unsure how to begin, ask them to pick a favorite animal and write the letters down the side of the page (e.g. ROBIN). Ask the student to find something they can see that starts with each letter of the word (e.g. R is for “red flowers”).

RESOURCES:

Bird Field Guides:

Birds, Nests & Eggs (Take Along Guides) by Mel Boring

Birds of North America by Kenn Kaufman

Bird Phone App:

[Merlin Bird ID App](#) from Cornell Lab



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Curriculum Set: All About Birds

Lesson 3: Bird Adaptations

Goals: Students experiment with tools to discover how different adaptations help birds survive.

Science | Literacy | Art | Writing

Grade K-5

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Total lesson time: 50 minutes

Introduction to Adaptations: 10 minutes

Bird Beak Buffet: 20 minutes

Design a Bird: 20 minutes

Materials needed:

Best Beak in Boonaroo Bay by Narelle Oliver

Bird Beak Buffet materials

Beak/food labels

Small noodles (e.g. bowtie/rotini) = insects and bugs

Spaghetti noodles

Marshmallows = larvae

Small log with holes drilled in it

Red food dye = nectar

Tea leaves, large pieces of confetti, cut up pieces of plastic = algae

Dried beans or seeds = seeds

Big bowl with water

Small bowl with water

Clothespins

Skewers

Strainers

Tweezers

Pipets

Markers and paper

Introduction: Pick one activity from below (10 minutes)

1. Read *Best Beak in Boonaroo Bay* by Narelle Oliver (Recommended for grades K-2).
 - a. Ask why students think the birds all won the contest. Birds have special beaks that eat different kinds of food.
 - b. Define adaptation (when they something special (e.g. beak design) that helps them survive).
2. Ask each student to write an example of a bird adaptation (feet, feathers, color, etc.) on the board (Recommended for grades 3-5).
 - a. Review answers and discuss what each adaptation might be used for.
 - b. Talk about generalist vs. specialist bird species

- i. Generalists can live in most places and their diets can consist of a variety of foods
- ii. Specialists live in a specific habitat and eat only one or two specific foods (they have adaptations that limit them to their specific habitat or specific foods).

Bird Beak Buffet: (20 minutes)

3. Set out tools with sign that shows an image of each bird and what tool represents its beak. Set out food items with sign that shows images of what each item represents (e.g. tea leaves = algae). These are representations for bird food we use. Use whatever you would like to represent the different foods that make up birds' diets (use bird seed, for seeds if you want!).


Food and Items	Bird Food
Small Noodles	Insects and bugs
Marshmallow stuffed in logs	Larvae
Red food dye in small bowl	Nectar
Tea leaves in big bowl	Algae
Dried beans or seeds	Seeds/nuts
Spaghetti noodles	Worms

4. Hand out a cup to each student. Explain this is their bird's stomach. Ask students to choose a bird and pick up the tool that represents its beak:

Bird	Tool
Cardinal	Clothespin
Hummingbirds	Pipets
Mallard	Strainers
Robin	Tweezers
Woodpecker	Skewers

5. Ask students what types of food they think their bird eats.
6. Tell students to try and fill up their cup with as much food as possible using only their beak to pick up the food.
7. For an added challenge, time students to see how quickly they can fill up their cup.
8. Ask the kids what foods were easiest for each bird to eat. Were there some birds that could eat more types of food than others? What birds were highly specialized (adapted) to only eat one kind of food? Below is a table with the items these birds would usually eat:

Bird	Food
Cardinal	Seeds
Hummingbirds	Nectar
Mallard	Algae



Robin	Worms and Insects
Woodpecker	Larvae

Build a Bird: (20 minutes)

9. What are other types of bird adaptations?
10. Ask students to design a bird with special adaptations. Kids are encouraged to be creative and make up new adaptations. You can frame it as designing a bird to survive the end of the world.
11. Kids can present their drawings. Some groups liked a Battle of the Birds. A panel rated the birds as the most likely to survive the end of the world based on the drawings and presentations. The top three birds went on to a Q&A with the panel to declare a winner (e.g. What would your bird do if there was a hurricane?).



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Curriculum Set: All About Birds

Lesson 4: Migration Obstacle Course

Goals: Discover obstacles to bird migration and how humans can help migrating birds.

Science | Literacy

Grade K-5

Created By:

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Total lesson time: 45 min

Introduction to Migration: 20 minutes

Migration Obstacle Course: 20 minutes

Journaling: 5 minutes

Materials needed:

How Do Birds Find Their Way? by Roma Gans

Migration Obstacle Course materials:

Saran wrap

Two chairs

Plastic bags

Traffic cones

Cardboard boxes

Rope grid on floor (2 squares wide, 5 squares long)

Hula hoops

Blindfold

Introduction to Migration: 20 minutes

1. Read *How Do Birds Find Their Way?* by Roma Gans

a. What birds migrate?

- Geese, ducks, and swans
- Hummingbirds
- Many (but not all!) songbirds: e.g. bluebird, warbler, robin

b. Why do birds migrate?

- Moving from areas of low resource availability to areas of high resource availability
- Two main resources: food and nesting locations

Bird Migration Obstacle Course: 20 minutes

1. Set up obstacle course and explain each obstacle to the students:

Item	Obstacle	Action
Saran wrap between chairs	Window	Fly under
Plastic bags	Pesticide-ridden fields	Jump over
Traffic cones	Bright lights and communication towers	Put on blindfold and weave through cones
Boxes	Tall buildings	Jump over
Rope grid on floor (2 squares wide by 5 squares long)	Power lines	Touch every square without touching the ropes
Stationary person with arms out, turning back-and-forth	Wind farm	Fly around
Hula hoops	Shrinking habitat	Jump in each one without missing
Person crawls along a straight	Cat	Fly past the cat without



horizontal line		being touched
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2. Explain that you are a migratory bird flying north from Mexico to Wisconsin for the summer. The goal is to avoid all the hazards in order to survive. If you fail at any point along the obstacle course, you “die” and do not complete the migration.
3. Time students as they go through the course.
4. After completing the course, track how many students survived.
 - a. Of the obstacles encountered, in which do humans play a role?
 - b. What can you/your community do to help birds migrate more safely?
 - i. e.g. grow organic crops only, keep cat inside
 - ii. Remove one or two of the obstacles related to the actions we can take to help birds migrate and re-run course.

Journaling: (20 minutes)

5. Science Journaling
 - a. Everyone writes the date, time, location, and weather.
 - b. Everyone takes time to write/draw what they learned about their migration, questions they have, or how humans can help migrating birds.
 - c. For grades K-2, use a larger group journal that everyone contributes towards. Hand out slips of paper for students to write their name and a way they can help birds. Paste the slips in the book.
 - d. Model effective journaling by recording your own observations and sharing with the students.
 - e. If a student is unsure how to begin, ask them to pick a favorite animal and write the letters down the side of the page (e.g. ROBIN). Ask the student to find something they can see that starts with each letter of the word (e.g. R is for “red flowers”).



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Curriculum Set: All About Birds

Lesson 5: Citizen Science

Goals: Document bird sightings and submit to scientists to advance scientific discovery and create practical guidelines for management.

Science | Writing

Grade K-5

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Performance Standards

Environmental Education: A4.1, A4.2,

Total lesson time: 1 hr

What is Citizen Science? : 10 minutes

Bird Count: 30 minutes

Journaling: 20 minutes

Materials needed:

Science journals

Binoculars (optional)

Citizen Science bird count sheets

Bird field guides

Lesson Tips:


- You can check out bird field guides at most libraries. You can also use *Madison Audubon's Bird Guides for Kids* (donation of \$5/book) which includes 27 of the more common birds in south central Wisconsin. This book's simpler format includes fun facts and large pictures.

What is Citizen Science? : (10 minutes)

1. What is Citizen Science?
 - a. Who is a citizen? We all are! We can all be scientists.
 - b. Scientists need information about birds everywhere but they can't be everywhere at once. We can provide important data for them about birds in our backyards and neighborhoods.
2. Why is it important to know where birds are and when? (track migration, know if populations are increasing/declining)
3. How do people track birds?

Bird Count: (30 minutes)

2. Sit outside by feeders or in natural area. Remind students that birds will usually only come if everyone is quiet.
3. Ask students to make silent observations, and write or draw any bird sightings in journal. Stop periodically and ask what students have seen. Remind students to record features if they cannot identify the bird. Discuss and record on citizen science sheet
4. Hand out binoculars and review binocular basics from Lesson 2: Ornithology (always keep strap around neck and never walk while looking through the binoculars).

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5. Take a nature walk. Stop periodically to use binoculars. Discuss any sightings and record on the citizen science sheet.

Journaling: (20 minutes)

6. Science Journaling
 - a. Everyone writes the date, time, location, and weather.
 - b. Everyone takes time to write/draw what they saw during their nature walk, questions they have, or why citizen science is important.
 - c. For grades K-2, use a larger group journal that everyone contributes towards. Hand out slips of paper for students to write their name and their favorite bird they saw during the citizen science bird count. Paste the slips in the book.
 - d. Model effective journaling by recording your own observations and sharing with the students.
 - e. If a student is unsure how to begin, ask them to pick a favorite animal and write the letters down the side of the page (e.g. ROBIN). Ask the student to find something they can see that starts with each letter of the word (e.g. R is for “red flowers”).

Adjust this lesson for different age groups:

More Challenging:

- Show the students how to enter the recordings on ebird.com. Explain that this is how scientists access the information.

RESOURCES:

Bird Field Guides:

Birds, Nests & Eggs (Take Along Guides) by Mel Boring

Birds of North America by Kenn Kaufman

Bird Phone App:

[Merlin Bird ID App](#) from Cornell Lab




Curriculum Set: All About Birds

Additional Resources: Trivia Packet

Grade 3-5

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Insect Trivia

1. Butterflies use what body part to taste? (Feet)
1. Do boy or girl crickets chirp? (Boys)
2. Are centipede's insects? (No, they have 100 legs.)
3. What color is insect blood usually? (Yellow!)
4. Do insects have noses? (No, they "smell" using their antenna.)
5. How many "teeth" (stylets) do mosquitos have? (47)
6. How many ears do praying mantises have? (One – they are the ONLY animal with just one ear and it's in their chest!)
7. Are ladybugs herbivores or carnivores? (Carnivores, they eat aphids.)
8. Can bugs feel pain? (No.)
9. How many brains does a leech have? (32)
10. Why do fireflies light up? (To attract a mate – each have a unique code like a song.)
11. Is a bug's skeleton on the inside or outside? (Exoskeleton – like a set of armor.)
12. What do butterflies hatch out of? (A cocoon; ask students about metamorphosis.)

Reptile and Amphibian Trivia

1. What is the difference between venomous and poisonous? (Venom is injected, poison is absorbed or ingested; snakes are venomous, some frogs are poisonous.)
2. Snakes have a special body part called the Jacobson's Organ. What is this used for? Hint – it's in their mouth. (Taste air particles to "smell" the air. Snakes have terrible vision (they can only see vague black and white shapes) so they use their sense of smell to know their surroundings. Snakes cannot smell through their nostrils. They use their nostrils for breathing.)
3. If you were a ball python, what is the biggest size fruit that you could swallow whole? (Watermelon. Pythons can stretch their jaw in four different places in order to swallow their food whole. Their lower jaw isn't fused in the front (feel how your jaw is fused) so it can stretch much further.)
4. What is the difference between a lizard and a snake? (Snakes do not have eyelids – this is why it always looks like they are staring at you even when they are sleeping! There are legless lizards that look like snakes except that they have eyelids.)
5. Can reptiles and amphibians grow back body parts? (Both can regenerate.)
6. How long can a crocodile go without eating? (Two years.)
7. Which type of reptile doesn't have teeth? (Turtles.)
8. Why do frogs close their eyes when they eat? (The eye muscle pushes their food down their throat.)


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9. What is it called when a tadpole becomes an adult frog? (Metamorphosis – review.)
 10. How often do frogs shed? (Once a week they shed their entire body's skin and then eat it! Snakes and turtles shed their skin or scutes much less frequently, usually only once a month or every few months.)
 11. A group of birds is called a flock. A group of frogs is called: a herd, a colony, an army, or a swarm? (An army.)
 12. What colors can frogs see: (a) black and white, (b) same as humans, (c) only red and green? (Black and white.)
 13. Which of the following have webbed feet: frogs, toads, water turtles, box turtles? (Frogs and water turtles.)
 14. Name at least one way that snakes are good.
 15. Which of these characteristics do amphibians NOT have: slimy skin, scales, gills, legs? (Scales – reptiles and fish have scales.)


Mammal (Bat) Trivia

1. On average how many mosquitos do bats eat in one hour? (1200! Yay bats!)
2. How many babies does a bat mom have each year? (Only one.)
3. True or false: bats in Wisconsin drink blood. (False! Only three species of vampire bats drink animal blood and they do not even live in North America.)
4. True or false: bats are blind. (False, bats can see but they use echolocation to find food and avoid predators from far away distances.)
5. How many fingers do bats have on each wing? (Five.)
6. True or false: bats are the only mammals that fly. (True, sugar gliders and flying squirrels only glide, they cannot fly.)
7. Why do bats hang upside down? (They have weak legs, their tendons lock into place so it uses no energy to hang upside down.)
8. True or false: All bats eat insects. (False, lots of bats eat only pollen and fruit.)
9. True or false: bats have good hearing. (True, in fact they have the best hearing of all land mammals.)
10. Bats usually hunt for insects at night. What is this called? (Nocturnal.)
11. True or false: All bats have rabies. (False! All mammals can get rabies, but very few bats actually have it. Bats are very clean and groom themselves like cats.)
12. True or false: Bats can get tangled in my hair. (False! Remember bats use echolocation? This helps them avoid getting tangled in your hair or touching you at all. They see you as a predator and do NOT want to get anywhere near you.)

Bird Trivia

13. What is the state bird of Wisconsin? (Robin)
14. What bird's call sounds like "Who cooks for you? Who cooks for all?" (Barred Owl)

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15. Which of the five senses is strongest for a bird? (Sight. If we had eyes like a bird, they would be the size of baseballs.)
 16. What makes a bird a bird (i.e., what do birds have or do that no other type of animal has or does)? (Feathers. Explain why it's not beaks (turtles), flight (insects, bats), eggs (platypus, reptiles, amphibians.))
 17. What is the fastest bird in the world? (Peregrine Falcon)
 18. How many bird species are there in the world? (10,000), the US? (900), WI? (about 400)
 19. What are different ways that humans can help bird populations?
 20. Hummingbird fun facts for true/false:
 - a. Can fly backwards
 - b. About the weight of a penny
 - c. Cannot smell at all
 21. How many eyelids do birds have? (Three. The third is called a nictitating membrane. It's clear-ish and used to protect the eye while flying or swimming, like a goggle.)
 22. What is unihemipheric sleep? (When we go to sleep, our entire brain enters sleep mode. Certain animals like ducks can keep half of their brain awake while the other half sleeps. You can see groups of mallard ducks where the ones on the inside of the circle are fully asleep (both eyes closed) because they feel safe from predators. The ducks on the outside of the circle only partially sleep. The eye facing the inside of the circle is closed (asleep), but the eye facing outwards is open so they can keep alert and protect the group. Dolphins and whales also use unihemipheric sleep since they need to stay awake to remember to swim to the surface and breathe air.)
 23. Are birds warm or cold blooded? (Warm blooded, like mammals.)
 24. True or false – all bird species build nests. (False, some species like the kestrel are cavity nesters and look for holes in trees or for bird houses to nest in.)
 25. Why do woodpeckers peck on trees? Hint – it's not to drill holes to find insects. (Woodpeckers tap on trees to communicate. They can't sing like many other birds.)
 26. Can birds dream? (Scientists think that birds can dream, and that they dream about singing in order to improve their singing the next day.)
 27. Crows live in every state of the United States except one. Which one? (Hawaii)
 28. What bird needs to put its head upside down in order to eat? (Flamingo)
 29. True or False. All birds have hollow (pneumatic) bones? (False. Some diving birds – like loons or puffins – do not have hollow bones – that would make diving difficult)

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30. True or False. Most birds cannot move their eyes. (True. Birds with eyes on the sides of their heads have a wide [visual field](#), while birds with eyes on the front of their heads, such as owls, have [binocular vision](#) and can estimate the [depth of field](#).)