madison AUDUBON society

Outdoor Adventures

Goal: Inspire stewardship for birds and nature through exploration and service learning.

Grades 6 - 8

Created By:
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Curriculum Set: Outdoor Adventures

Lesson 1: Ornithology

Goals: Begin to break down any discomfort or fears of the outdoors and observe one's surroundings with new eyes. Learn how to use binoculars, identify birds by sight and sound, and use a field guide.

Grade 6-8

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Total lesson time: 1 hour

Introduction: 10 minutes
Birding: 45 minutes
Debrief: 5 minutes

Materials needed:

Trivia questions
Binoculars (optional)
Bird field guide

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.
- This lesson focuses on instilling an appreciation for nature through a love for a birds to give context to the service learning activities.

Introduction: (10 minutes)

1. Describe Madison Audubon Society
2. Explain goal of Outdoor Adventures – to be Bird Ambassadors!
    a. We'll do this by helping birds and other wildlife in Madison.
    b. We'll be working alongside scientists nationwide to make a difference.
3. This first session is dedicated to exploring in nature so we feel comfortable getting our hands dirty next time.

Birding: (45 minutes)

4. Define ornithology
    a. Why study birds?
        i. To determine the health of bird populations and the health of populations affected by birds (predator and prey species, plant species associated with birds)
        ii. Understand ecosystem health. It can be determined with the help of bird population data.
5. 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.

6. Take a nature walk stopping periodically to look and listen for birds. Use the bird guide to identify bird sightings.
7. 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?
8. If the kids would like a break, play bird trivia.

Debrief: (5 minutes)

9. Debrief
    a. Brainstorm ways that we can all help birds.
    b. Discuss different methods of helping birds and wildlife – habitat restoration, citizen science, advocacy, educating others.
    c. As Bird Ambassadors we will help birds in all of these ways.

RESOURCES:

Bird Field Guides:
Birds of North America by Kenn Kaufman

Bird Phone App:
Merlin Bird ID App from Cornell Lab

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Curriculum Set: Outdoor Adventures

Lesson 2: Habitat Restoration – Prairie Seed Collection

Goals: Differentiate between native and invasive species and understand the importance of restored natural areas. Observe the differences between prairie plants and the benefits they provide.

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Total lesson time: 1 hr

Introduction: 15 minutes
Seed Collection: 45 minutes

Materials needed:

- Paper grocery bags
- Clippers
- Garden gloves
- Pictures to identify common prairie plants

Lesson Tips:

- Seed collection occurs in early fall.
- Contact Dane County Parks for assistance choosing a location for habitat restoration and to determine what seeds to collect.

Introduction: (15 minutes)

1. Review the different ways we will act as Bird Ambassadors – habitat restoration, citizen science, advocacy, and educating others.
2. Today we will focus on habitat restoration.
3. Prairie is essential habitat for wildlife. What animals rely on prairies for shelter and food? (coyotes, foxes, rabbits, mice, birds!, insects)
4. Dane County Parks creates new prairies for birds and wildlife but they need seeds. Existing prairies contain the seeds we need to plant the new prairie.
5. Define native and invasive species. What are benefits of planting native species?

Seed Collection: (45 minutes)

6. Show pictures of seed species we want to collect.
7. Demonstrate how to safely remove seeds. (Be careful not to crush them when opening the seed casings)
8. Hand out paper bags, clippers, and gloves. Working with a partner, kids choose one prairie plant species for their first bag.
9. Halfway, switch to a new prairie plant species making sure to use a new bag.

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Curriculum Set: Outdoor Adventures

Lesson 3: Water Quality

Goals: Define watershed and discuss how water quality impacts wildlife. Use scientific tools to monitor water quality and evaluate whether it is healthy. Prevent runoff pollution in the community.

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Total lesson time: 2 hr

Introduction: 5 minutes
What is a Watershed: 10 minutes
Scavenger Hunt 30 minutes
Water Quality Testing: 30 minutes
Storm Drain Marking: 45 minutes

Materials needed:

- Watershed model with chocolate powder, green dye, red dye, spray bottle and water
- Watershed Scavenger Hunt sheets
- Clipboards
- Water quality testing equipment
- Storm drain marking kits

Lesson Tips:

- You may wish to split the activities into multiple lessons and spend more time on each activity. Students can also build their own watershed models as an additional activity.
- This lesson works best in warmer weather. Water quality testing will not work as effectively after the ice freezes and storm drain marking can only occur in warm, dry weather.
- To learn how to use and to borrow water quality testing and storm drain marking kits, contact Mindy Habecker, Dane County UW-Extension Natural Resources/Community Development Educator at 608-224-3718.
- If you are not in Madison, check with your city municipality before posting storm drain markings. If you are in Madison, double-check with UW-Extension.
- Use storm drain stencils, or create your own storm drain marking kits.
- We recommend visiting a natural area near a lake or stream for the Scavenger Hunt.

Introduction: (5 minutes)

10. Review the different ways we will act as Bird Ambassadors – habitat restoration, citizen science, advocacy, and educating others.
11. Last time we performed a habitat restoration activity. This time we will focus on citizen science and educating others.

What is a Watershed: (10 minutes)

12. Define watershed.
13. Show watershed model. Ask kids to add pollutants. One kid will use the spray bottle to mimic rain.
14. What happens to the pollutants? Why is this bad?

15. How could we prevent the pollutants from entering the lake?
    i. What did we do last week?
16. We are going to complete a Watershed Scavenger Hunt to find out what helps and hurts water quality around Madison

Scavenger Hunt: (30 minutes)

17. Split into small groups and complete scavenger hunt while going on a nature walk.
18. Discuss answers.
19. Discuss whether the group thinks the surrounding water bodies are healthy or not and what observations you used to make this decision. We are going to test this preliminary evaluation.

Water Quality Testing: (30 minutes)

20. What is Citizen Science?
    i. Who is a citizen? We all are! We can all be scientists.
    ii. Scientists need information about water quality everywhere but they can't be everywhere at once. We can provide important data for them about water quality in Madison.
    iii. Why monitor water quality?
        1. Why is clean water important to community members and wildlife?
        2. We will report the data we collect to scientists. Based on data we submit can determine which areas most need restoration to improve water quality. For instance, they might plant prairie plants along this shore to filter out pollutants.
21. Temperature/Turbidity
    a. Show the kids how to take the temperature of the water. Have the kids write the number in the correct place on the table.
    b. Discuss with the kids why water temperature is important.
    c. Let the other kids try measuring the temperature.
    d. Repeat with turbidity.
22. Macroinvertebrate biotic index
    i. Show the kids how to find and identify the macroinvertebrates in the water sample.
    ii. Fill out the biotic index sheet. Calculate the biotic index score and write the number in the correct place on the table.
    iii. Look at the chart to see if the biotic index is acceptable for good water quality.
    iv. Discuss with the kids why measuring macroinvertebrate diversity is important.

Storm Drain Marking: (45 minutes)

23. Review the definition of runoff and whit it is important to prevent it from entering waterways.
24. How does runoff enter waterways in our neighbored? Through storm drains. If we put trash or leaves in the gutters it will end up in our water.
25. Putting up signs or stencils will remind our community members to put trash and leaf litter where it belongs instead of in our waterways. Keeping our lakes and streams clean will provide good habitat for our favorite birds and local wildlife.
26. Demonstrate how to secure a marker.
27. Break into two groups and hand out supplies. Attach a marker wherever there is a storm drain.
28. Discuss how this helps spread the word and educates our community.

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Curriculum Set: Outdoor Adventures

Lesson 4. Great Backyard Bird Count

Goals: Students learn how to use binoculars, identify birds by sight, and use a field guide. Participate in a nationwide citizen science project.

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Total lesson time: 1hr 15 min – 45 min

Introduction: 10 minutes
Nature Walk: 15-45 minutes
Data Submission: 20 minutes
DIY Bird Feeders: 30 minutes

Materials needed:

Binoculars (optional)
Bird field guide
Clipboards
Computer
DIY Bird Feeder Supplies

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.
- The Great Backyard Bird Count takes place four days every February. You can participate in a citizen science bird count any day though by visiting eBird.

Introduction: (10 minutes)

1. Review the different ways we will act as Bird Ambassadors – habitat restoration, citizen science, advocacy, and educating others.
2. Last time we completed a citizen science project collecting water quality data. This time we will do a different type of citizen science project recording bird species.
3. Review the definition and importance of citizen science.
4. The Great Backyard Bird Count is a day where people just like us collect data on birds all across the country.
    a. Why is it important to study birds?
    b. What does an increase or decrease in bird populations show?
    c. What does it mean if a bird shows up in a new area?
5. What are the Great Backyard Bird Count rules?
    a. Spend (at least) 15 minutes recording any birds seen and how many.
    b. For each species, only record the maximum number of birds you see at any one time. This ensures we don't double-count a bird.
    c. If you can identify a bird by sound, it counts even if you cannot see the bird.

Nature Walk: (15-45 minutes)

10. Binocular basics

    a. Reinforce the two binocular rules: strap stays around their neck and never walk with binoculars up to their face.
11. Take a nature walk stopping periodically to look and listen for birds. Use the bird guide to identify bird sightings.
12. Record any bird sightings. Besides the species and number seen, record any interesting notes (e.g. female/male, fledgling, at a feeder).

Data Submission: (20 minutes)

13. Log on to ebird.com.
14. Submit bird data.
15. Discuss with group why they think you saw the birds you did, or why you didn't see other birds you expected to see.

DIY Bird Feeders: (30 minutes)

- Discuss ways to help birds, especially during the winter.
- Make bird feeders or design houses using engineering skills knowing anything can usually be turned into a birdhouse as long as it has drainage holes, hole to enter, place to hang, and can be cleaned easily.

16. Hang feeders near home or community center to encourage birds all winter long.

RESOURCES:

Bird Field Guides:
Birds of North America by Kenn Kaufman

Bird Phone App:
Merlin Bird ID App from Cornell Lab

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Additional Resources: Trivia Packet

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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.)

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 hot 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)

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)

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.)