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Wisconsin Wildlife

Goals: Connect youth with their local environment by learning about different native animals. Discover the unique characteristics that define each animal class.

Science | Writing | Literacy

Grades K-5

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Curriculum Set: Wisconsin Wildlife
Lesson 1: Entomology

Goals: Explain what makes an insect an insect. Transform potential fears of insects into fascination and encourage students to make observations about their natural surroundings on a more close-up level.

Science | Literacy | Writing
Grades K-5

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Performance Standards

Environmental Education: A4.1, A4.2,

Total lesson time: 50 min

What is Entomology: 20 minutes

Bug Walk: 30 minutes

Journaling: 20 minutes

Materials needed:

Big Bug Surprise by Julia Gran

[Trivia questions](#)

Nets

Magnifying glasses

Insect field guide

Containers for insect collection

Science journals

Lesson Tips:


- You can check out insect field guides at most libraries.
- If students do not already have a science journal, check out the “I’m a Scientist!” curriculum, Lesson 1: What is Science? for more information.

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

1. Read *Big Bug Surprise* by Julia Gran (recommended for grade K-2)
 - a. What makes an insect an insect?
 - i. Three body parts (head, thorax, abdomen)
 - ii. Six legs (is a spider an insect?)
 - iii. Antenna (for feeling and “seeing”)
 - iv. Wings
 - v. Cold blooded (the temperature of their environment controls the warmth of the insect’s body)
 - vi. Lay eggs
2. Play insect trivia (recommended for grade 3-5)
 - a. Trivia questions at bottom of page
 - b. Have students explain their answers and discuss why each answer is the correct one.

Bug Walk: (30 minutes)

3. Provide nets, magnifying glasses, and containers for insect collection.
4. Ask kids where they think they can find insects? (i.e., under logs or rocks, on trees or leaves, in the air, on the ground)
5. Use insect field guide to identify species.

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6. If the kids choose to catch insects with the nets or use the containers to get a closer look at the insects, make sure they remember to gently release the insects when they are done.

Journaling: (20 minutes)

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 insect 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:

Insect Field Guides:

Caterpillars, Bugs and Butterflies: Take-Along Guide by Mel Boring

National Audubon Society Field Guide to Insects and Spiders

Peterson Field Guides – Insects by Donald J. Borror and Richard E. White



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Curriculum Set: Wisconsin Wildlife
Lesson 2: Ornithology

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

Science | Literacy | Writing
Grade K-5

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Total lesson time: 50 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 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.
- If students do not already have a science journal, check out the "I'm a Scientist!" curriculum, Lesson 1: What is Science? for more information.
- This program pairs well with Bird Call BINGO from the "All About Birds" curriculum, Lesson 1: Beginning Birding, and with the Bird Count from the "All About Birds" curriculum, Lesson 5: Citizen Science.

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

1. Read *The Birdwatchers* by Simon James (recommended for grade K-2)
 - a. Define ornithology
 - i. Why study birds?
 1. Determine the health of bird populations (and the populations of plant and animal species affected by bird numbers, like prey and predators).
 2. Understand ecosystem health. It can sometimes be determined with the help of bird health data.
 - ii. Covered in feathers (what are feathers used for?)
 - iii. Warm blooded (body temperature is regulated by the bird, outside temperature has little impact)
 - iii. Birds lay eggs
 - b. What makes a bird a bird?
 - i. Covered in feathers (what are feathers used for?)
 - ii. Warm blooded (body temperature is regulated by the bird, outside temperature has little impact)
 - iii. Birds lay eggs
2. Ask kids to each write an example on the board of how they can tell different birds apart (recommended for grade 3-5)
 - a. Review answers and discuss other potential answers to identify different bird species.
 - b. Define ornithology?

- 
- i. Why study birds?
 3. Play bird trivia (recommended for grade 3-5)
 - a. Trivia questions at bottom of page
 - b. Have students explain their answers and discuss why each answer is the correct one.

Birding: (30 minutes)

4. 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.
5. Take a nature walk stopping periodically to look and listen for birds. Use the bird guide to identify bird sightings.
6. 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)


7. Debrief
 - a. Discuss ways that we can all help birds.
8. 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: Wisconsin Wildlife
Lesson 3: Herpetology

Goals: Differentiate between reptiles and amphibians. Explain the different stages of metamorphosis. Define bio indicators and invasive species and understand the significance of both.

Science | Literacy | Writing
Grade K-5

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Total lesson time: 1 hr 10 minutes – 30 minutes

What is Herpetology: 20 minutes

Metamorphosis Obstacle Course: 20 minutes

Frog Skin Slime: 10 minutes

Reptile Meet and Greet (optional): 20 minutes

Journaling and Debrief: 20 minutes

Materials needed:

Growing Frogs by Vivian French

[Trivia questions](#)

Envelopes

Green pieces of construction paper in 1”x1” squares

Brown pieces of construction paper in 1”x1” squares

Plastic cones or flags

Leaves

Two chairs

Towel to drape over chairs

Turtle and shells (optional)

Cornstarch

Bowls, plastic spoons

Green food dye

Science Journals

Lesson Tips:

- If students do not already have a science journal, check out the “I’m a Scientist!” curriculum, Lesson 1: What is Science? for more information.

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

- Read *Growing Frogs* by Vivian French (recommended for grade K-2)
 - a. What makes an amphibian an amphibian?
 - i. Permeable skin (define)
 - ii. Lay eggs
 - iii. Born in water
 - iv. Cold blooded (define)
 - b. What makes a reptile a reptile?
 - i. Body covered in scales
 - ii. Lay eggs
 - iii. Born on land
 - iv. Cold blooded (review)
- Play amphibian versus reptile trivia (recommended for grades 3-5)
 - a. Trivia questions at bottom of page
 - b. Have students explain their answers and discuss why each answer is the correct one.



Metamorphosis Obstacle Course: (20 minutes)

- Define amphibian metamorphosis
 - a. Review from book *Growing Frogs* by Vivian French
 - b. Amphibians lead a “double-life”. First in the water as an egg and tadpole, and then on land as a frog.
- Metamorphosis Obstacle Course
 - a. Set up in a field or gym.
 - i. The first station is the “pond”. Scatter the algae pieces (green construction paper pieces).
 - ii. Set up four cones or flags in a row right beyond the “pond” so that the kids can crawl between the cones.
 - iii. The second station is the “marshy banks”. Scatter the insect pieces (brown construction paper pieces).
 - iv. The third station is a tunnel. Set up the two chairs across from each other and drape the towel over them.
 - b. Hand out an envelope to each kid.
 - c. Lead the kids through the obstacle course once explaining each step.

Step 1: TADPOLE

You are one of thousands of tadpoles that have hatched from frog eggs in the pond. Tadpoles start as herbivores. What does this mean? You eat algae and other plants. Do tadpoles have legs? No! They only have a tail. Stand on one leg (your tail) and hop through the pond, picking up three pieces of algae and place in your envelope.

Step 2: METAMORPHOSIS

You have grown legs, developed lungs, and absorbed your tail. This is called metamorphosis. You can now crawl as a small frog. Crawl out of the pond by crawling around the four flags.

Step 3: FROG


You are out of the pond. Now that you are a frog, you are officially a carnivore. What do carnivores eat? You need to find three insects in the leaves. Put them in your envelope. Remember, you need to hop!

Step 4: COLD BLOODED

Since you are an amphibian, you are cold blooded and therefore, if it’s hot out you become hot, if it’s cold out, you become cold. Right now, it’s summer time and you are HOT! Your skin needs to stay moist but it’s drying out. Burrow through the tunnel to cool off. Frogs dig through tunnels with their rear legs, so make sure you go backwards through the tunnel.

Step 5: RETURN TO POND

After hibernating, it’s time to return to the pond and lay your own eggs. Unfortunately, while you were hibernating someone built a road between you and the pond so you will need to run as fast as you can to avoid getting hit by a car.

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- d. Time the kids as they “morph” into frogs.
 - e. Assign other kids roles like pollution in the pond, predators right outside the pond, and cars on the road.
 - i. Discuss the challenges frogs face (e.g., habitat loss, pollution, roads) and how we can help frogs.

Frog Skin Slime: (10 minutes)

- Remind kids that frogs have permeable skin.
 - a. Frogs have moist skin that they can breathe through – why is this important? (Frogs are bio indicators – they take in toxins from the water through their skin. If frog populations are decreasing we know the water quality is bad. This could lead to human health problems too.)
 - b. Let’s see what a frog feels like!
 - i. Make amphibian slime by pouring and mixing water into cornstarch. Add green food dye.

Reptile Meet and Greet (optional): (20 minutes)

- Review reptile characteristics.
- Discuss water quality and quantity impact on wildlife and humans
- Show turtle and shells
 - a. Answer questions about turtles, or water wildlife in general
 - b. Explain what an invasive species means
 - c. Allow kids to pet turtle and then follow with hand sanitizer

Journaling: (20 minutes)

- Journaling
 - a. Everyone writes the date, time, location, and weather.
 - b. Everyone takes time to write/draw what they learned, questions they have, or ways they can help frogs.
 - 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 one way they will help frogs. 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”).



Curriculum Set: Wisconsin Wildlife
Lesson 4: Mammalogy

Goals: Learn the unique characteristics of a mammal and discover the importance of bats by debunking the common myths surrounding this misunderstood animal. Explain the concept of echolocation.

Science | Literacy | Writing

Grade K-5

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Total lesson time: 1 hr

What is Mammology: 20 minutes

Echolocation Activity: 20 minutes

Journaling and Debrief: 20 minutes

Materials needed:

Ziping, Zapping, Zooming Bats by Ann Earle

[Trivia questions](#)

Blindfold

Science journals

Lesson Tips:


- [Bat Conservation of Wisconsin](#) provides excellent hour-long presentations about bats including a meet and greet with a Great Brown Bat.
- If students do not already have a science journal, check out the “I’m a Scientist!” curriculum, Lesson 1: What is Science? for more information.

What is Mammology: Pick one activity (20 minutes)

1. Read *Ziping, Zapping, Zooming Bats* by Ann Earle (recommended for grades K-2)
 - a. What makes a mammal a mammal?
 - i. Have hair/fur on their body
 - ii. Are warm blooded
 - iii. Do not lay eggs (normally)
 - iv. Produce milk to feed babies.
 - b. We are going to learn about bats today. Some people find bats scary, but bats are actually really good for our environment! What are some ways bats are good?
 - i. Eat pesky insects.
 - ii. Pollinate flowers.
2. Play bat trivia (recommended for grades 3-5)
 - a. Trivia questions at bottom of page
 - b. Have students explain their answers and discuss why each answer is the correct one.

Echolocation Activity: (20 minutes)

3. Bats are nocturnal. What does that mean?
 - a. If they are awake at night, how do they find their food?
 - b. Bats don’t have good eyesight so they rely on echolocation.
4. Choose one person to be the bat and give them a blindfold.
5. Assign half of the remaining kids to be obstacles: tree, light post, etc. Ask the obstacles to spread out and pick a spot. Obstacles cannot move.
6. Assign the remaining kids prey (insects). Insects can run.

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7. The bat walks around (with his/her eyes covered) and says “Beep, Beep”. IF the bat is directly facing an insect, it will reply “Buzz Buzz” and IF the bat is directly facing an obstacle it will reply by saying what it is (e.g. “Tree”).
 8. The bat will try to tag the insects and avoid the obstacles.
 9. Once the bat tags an insect, the insect becomes the new bat. Obstacles and insects trade places.

Journaling and Debrief: (20 minutes)

10. Debrief
 - a. Review cool facts that we learned about bats.
 - b. Discuss challenges bats face to survive.
 - c. How can we help bats survive? (e.g. bat boxes, plant native flowers that attract insects)
11. Science Journaling
 - a. Everyone writes the date, time, location, and weather.
 - b. Everyone takes time to write/draw what they learned about bats or questions they have.
 - 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 one thing they learned about bats. 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: Wisconsin Wildlife
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 centipedes 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 preying 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. Are 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 clearish 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 on 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.)