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AUDUBON



Curriculum Set: Climate Initiative

Young Ambassadors for Birds in the Face of Climate Change

Curriculum Overview

Grade 4-8

Created By:

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Acknowledgements

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Goals

1. Students will understand what climate change is, what the effects will be on their local environment, and what they can do to help mitigate those effects.
2. Students will gain a greater appreciation for their local environment, and will be encouraged to pay closer attention to the plants and wildlife around them.


Overview

All of the lessons begin with a presentation to introduce the topic. The presentation, along with the lesson plan, will allow you to explain the details of climate change to students in a fun, interactive way. Each lesson also includes a hands-on activity or game to reinforce key topics. We recommend pairing lessons with a nature walk around your school's neighborhood to record phenology observations & enjoy your local natural environment.

These lessons are designed for 4th – 8th grade students and focuses on habitats in the Midwest. Starting in September and finishing in June, these 10 lessons span the school year. During this time, students will also be collecting phenology data for their own research project. At the end of the year they will compare their data with historical data sets.

FREE class field trips!

Madison Audubon Society has funding to bring 10 classrooms on a field trip to one of our sanctuaries. Students will get to explore local Wisconsin habitats and wildlife while on a nature walk. They can also complete service-learning projects like helping to collect or plant prairie seeds, and removing invasive plants.



Teachers that integrate these climate lessons into their classrooms will be eligible for one of these trips in the spring of 2016. Please contact MAS in the 2015-16 school year if you are interested in this opportunity.

Important topics covered:

1. Why local birds are important
2. The ways in which wildlife, plants, animals, the environment, and people are all connected
3. Climate change: what it is, what sorts of changes will happen in 50 or 100 years, and what we can do to help mitigate its effects
4. Generalist and specialist species

To make this curriculum less challenging:

1. Limit the number of things you record phenology data for: bird behavior is easy and fun!
2. Create tables with the data, but hold off on graphing it.
3. Provide historical data for students, and do the comparison for them. Show them how the phonological events have shifted.

To make this curriculum more challenging:

1. Collect many types of data, including: temperature (daytime high and nighttime low), precipitation, ice cover, plant phenology, and bird behavior.
2. Make data collection and presentation more rigorous: have students graph data, and discuss different ways to present data visually.
3. Have students search for historical data themselves, rather than providing it for them. Or, let them explore data that you provide and decide how the phonological events have shifted.


Take it a step further:

1. Have your students teach *other* students some components of these lessons. We have had great success when students teach other kids to play the games.
2. Participate in citizen science programs like The Great Wisconsin Birdathon (wibirdathon.org), Project Feederwatch (feederwatch.org), The Great Backyard Bird Count (<http://gbbc.birdcount.org/>) or The Christmas Bird Count (Audubon.org/conservation/science/Christmas-bird-count).

Please contact Madison Audubon Society staff if you would like assistance adjusting these lessons to better fit your needs: info@madisonaudubon.org.


Materials & Equipment:


1. All lesson materials are available online for FREE at madisonaudubon.org.
2. Lesson Kits are available for educators to borrow for FREE at the Madison Audubon Society office: 1400 East Washington Ave, Suite 170, Madison, WI

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3. 53703. Please call (608-255-2473) or email (info@madisonaudubon.org) to reserve your kit rental today!
 4. It would be useful, but not strictly necessary, for classrooms to have access to a bird feeder, bird field guides, and binoculars. Contact our offices if you would like to discuss purchasing these for your classroom, school, or community.
 5. These lessons all include a pdf presentation to provide engaging visuals for students and to help you explain more complicated topics. It would be useful, but not necessary, for classrooms to have access to a laptop and projector or a smartboard. Educators could also print posters of select slides if a projector is unavailable.

Lesson Summaries

1. **Scientific Method (September):** We introduce the scientific method, data collection, and long-term data sets, emphasizing why each are important. Introduce phenology, and get the class started on collecting yearlong phenology data. We talk about how Aldo Leopold and Nina Leopold collected data like this in WI, and at the end of the school year we will compare our data with this historical data.
 - a. **ACTIVITY:** Color a phenology wheel for their favorite bird, plant, or animal.
 - b. **NATURE WALK:** this lesson is great to pair with a nature walk to get kids looking at local phenology.
2. **Habitat Scramble (October):** a very basic introduction to climate change: the fact that it is occurring, and general changes that will happen in the future to our world and Wisconsin. The majority of this lesson is comprised of our Habitat Scramble game. We also define habitat generalists and habitat specialists.
 - a. **GAME:** In Habitat Scramble, students pretend to be birds using the bird identification flash cards. Each bird has specific habitat types that they are able to thrive in. Different colors of construction paper represent habitat types. During each round of the game, students must find an appropriate habitat to inhabit (stand on). Teachers read different climate scenarios, and adjust the amount of available habitat as the environment changes.
3. **Carbon Cycling (November):** Learn the basics of carbon cycling, and how this affects the breakdown of natural materials in our world.
 - a. **GAME:** Students pretend to be oxygen and carbon dioxide molecules as they pass through plants, animals, and our atmosphere.
4. **The Greenhouse Effect (December):** We take what students learned about the Carbon Cycle and use it to introduce the greenhouse effect.
 - a. **ACTIVITY:** Students act out the greenhouse effect
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6. **Winter Adaptations of Animals (January):** This lesson discusses different methods that birds and mammals use to deal with Midwestern winters. Topics include: switching food sources, migration, hibernation, torpor, and changing pelage or plumage. We then discussed how climate change may impact these animals in the future.
 - a. **ACTIVITY:** Students used models of animal tracks to make prints in wet and dry sand. Learn how to ID common animal tracks with our fortune tellers. Students are able to touch study skins (furs) of several local animals, and think about what each type of fur might be useful for (semi-aquatic animals, staying warm all winter, camouflage).
 - b. **NATURE WALK:** this lesson is great to pair with a nature walk to get kids looking for tracks and other sign of animals in their neighborhood.
 7. **Build a bird adaptations (February):** This lesson defines what “adapt” and “adaptation” mean, and provides students with examples of cool bird adaptations.
 - a. **ACTIVITY option 1 (less advanced):** The build a bird art project allows students to select from different bird parts to create their own bird. Students can then write a few sentences about the adaptations their bird has .
 - b. **ACTIVITY option 2 (more advanced):** Students imagine a (made-up) bird with any adaptations they want. They draw and color the bird, and then write a description of its adaptations, its habitat, its favorite food, and how it finds food.
 8. **Migration (March):** Students are introduced to the topic of migration, and the impacts climate change will have on it. They learn about why birds migrate, which birds migrate, and how they migrate. Energy is discussed, as well as the fine balance between having enough fat reserves to migrate and eating so much that a bird is unable to fly.
 - a. **ACTIVITY:** A migration trivia game is built in to the end of the lesson.
 - b. **GAME:** Our migration obstacle course allows students to experience some of the perils birds face during migration.
 9. **Phenological Mismatch (April):** This lesson explains the ways that climate change may affect bird migration. Long distance migrants (those that travel to Mexico or South America) generally use day length (photoperiod) to determine when they migrate north in the spring. Short distance migrants (those that stay within the United States) can use weather patterns or insect activity to help determine when to move north. Short distance migrants will be better able to adjust their migration times as climate change causes spring to arrive earlier each year. They will likely still be able to take advantage or insect hatches. Long distance migrants will be unable to adjust because day length will not change. They will be mismatched with insect hatches, and will not have a large flush of insects to feed their chicks.
 - a.

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- b. **This lesson is the point where we present the historical data and compare it with current data that the students collected.**
 - c. **GAME :** In “Hunger Cranes”, Students use the bird ID flashcards to pretend they are a bird. They need to race from the starting point to their spring foraging grounds. Starting points are different for long versus short distance migrants and residents. Birds need to either pick up “specialized food” or “generalist food”. We discuss phenological mismatch & how it will affect migrating birds.
10. **Climate Forum (May):** Students pretend to be birds, and discuss the problems they face with climate change, and possible solutions. Break students up four groups: resident birds, short-distance migrant birds, long-distance migrant birds, and people.
- a. Meet with their own groups to discuss and plan their presentation
 - b. Each group presents to the class & teachers. The audience is given an opportunity to ask the group questions.
 - c. Group discussion at the end of lesson to reflect.
11. **Birdathon:** We recommend using a birdathon to celebrate the end of the school year, and the completion of the climate lessons. During a birdathon, students would try to see as many species of birds as possible during a set period of time. You may want to have a school-wide birdathon, where your students would teach others about birds. Or you may want to take your class on an hour-long nature walk around the neighborhoods surrounding their school. Celebrate all that they have learned throughout the school year!

* In addition to these lessons, students will need to be given time to record their phenology data. This might happen in the beginning or end of the day, or in the 5 minutes following recess.