



madison
AUDUBON



Curriculum Set: Climate Initiative

Young Ambassadors for Birds in the Face of Climate Change

Lesson 8: Phenological Mismatch

Goal: Students learn the effects of warming springs on migratory birds.

Science

Adaptable for Grades 4-8

Created By:

Carolyn Byers, Education Director
(608) 255-2473, ext. 555 (office)
carolyn.byers@madisonaudubon.org


Contact us at MAS:

1400 East Washington Ave
Madison, WI 53703
608-255-2473
info@madisonaudubon.org



Produced under a 2014-2016 Grant from National Audubon Society and a 2015-2016 grant from the Wisconsin Environmental Education Board.





Total lesson time: 1 hour – 1.5 hours

Lesson: 40 minutes

Hunger Cranes: 30 minutes

Materials needed:

Presentation on Climate Initiative Lesson 8, Phenological Mismatch


Projector & laptop/ smartboard for PDF presentation

Hunger Cranes Game

Lesson


Tips:

- Write the new vocabulary words on the board so that kids know how they are spelled AND teachers can refer to them later on in the presentation and throughout the day.
- During our pilot lessons, it was more engaging for the class if one student took notes in a visible way during the presentation (either on a large notepad, chalk board or white board). The rest of the class saw what that student was highlighting, and this reinforced key ideas.



PDF Presentation: (30 minutes)

1. Introduction: review the definitions for generalist and specialist species.
2. Review Migration:
 - a. What is migration? Seasonal movement of animals from one place to another.
 - b. Why do some birds migrate? They need to find food.
 - c. Do all birds migrate? No.
 - d. Why not? They are able to switch food sources as the seasons change so that they can find food in one place year-round.
 - e. Today we will talk about how climate change may affect bird migration.
3. Review how far birds migrate:
 - a. Long distance- usually eat insects and/or fruit, they travel to central or south America during the winter
 - b. Short distance- usually only travel as far as they need to in order to find food, typically to the southern United States.
 - c. Irruptive migrants- only move when they can't find food (examples: Snowy or Great Gary Owls moving south to WI in years when food is hard to find).
4. Phenology data:
 - a. Discuss the data that your students collected, and what other pieces of data they could have collected if we had more time (temperature, ice cover, rainfall/precipitation, data on plants greening up, etc). Make sure to end the discussion talking about bird phenology data.
 - b. Compare the data we collected this year with historical data from the early 1900s.
 - c. Explain the timeline (months progressing through time), point out which month we're currently in, and explain that where the bird appears on the timeline is when it arrives back in WI after spring migration.
 - d. First group of birds:
 - i. Red-winged Blackbirds used to arrive in mid-March, and now arrive in mid-February.
 - ii. Canada Geese used to arrive in mid-March, and now arrive in late January (some stay in Wisconsin all year)
 - iii. Eastern Meadowlarks used to arrive in mid- March, and now arrive in Late February
 - iv. Eastern Phoebe used to arrive in early April, and now arrive in early March
 - v. Ask kids what has happened? For all of these birds, there has been a shift: they are arriving earlier each year.
 - e. Second group of birds:
 - i. Bobolink and Upland Sandpiper are STILL arriving at the same time that they used to in 1900. They have NOT shifted.
 - ii. Ask kids what they think of this. Can they come up with a hypothesis about why this is?
 - f. Explaining the shift (or lack there of): how birds know when to migrate
 - i. The first group of birds are all short distance migrants.

- 
1. Ask kids to tell you how far short distance migrants travel. (to the southern United States, sometimes Central America)
 2. How do short distance migrant birds know when it's time to migrate?
 - a. They rely on LOTS of cues. While they're down in the Southern US, they are able to use temperature, sunlight, plants sprouting, and food availability to know that they can start heading north.
- ii. The second group of birds were long distance migrants.
1. Ask kids to tell you how far long distance migrants travel (to South America!)
 2. How do long distance migrants know when it's time to migrate?
 - a. PHOTOPERIOD. Discuss this word: what does "photo" mean? Light. What does "period" mean? A length of time.
 - b. Photoperiod is the length of the day, or how much daylight there is in a day.
 - c. Remember how early it used to get dark during the winter? And how long it stays light during the summer? In Wisconsin, day length is always changing depending on the season.
 - d. Even though day length changes during the year, there is always the same amount of daylight on the 4th of July every year. And there is always the same amount of daylight on your birthday.
 - e. Long distance migrants travel