

The Great Migration Educator Guide

A resource for using QUEST video in the classroom

Watch it online <http://www.kqed.org/quest/television/the-great-migration> | 10:17 minutes



QUEST SUBJECTS

Life
Science

Biology
Health
Environment

Earth
Science

Geology
Climate
Weather
Astronomy

Physical
Science

Physics
Chemistry
Engineering

CA SCIENCE STANDARDS

Grade 6

Ecology (Life Sciences)

5. (e) Populations of organisms can be categorized by the functions they serve in an ecosystem; the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures and soil composition.

Grades 9-12

Ecology (Biology/Life Sciences)

6. (b) Changes in an ecosystem result from changes in climate, human activity, introduction of nonnative species or changes in population size.

Energy in the Earth System

6. (c) Earth's climate has changed over time, corresponding to changes in Earth's geography, atmospheric composition and other factors, such as solar radiation and plate movement.

PROGRAM NOTES

Migrating birds face many threats along their routes, or flyways. In fact, the majority of migrating songbirds and about half of the migrating coastal shorebird species in the United States have suffered population declines in recent years. **QUEST** visits the Pacific Flyway to learn how biologists and conservationists are tracking bird migration to better understand the changing rhythm of our natural world.



In this segment you'll find...

- 📍 how tracking migratory birds can help conservationists and biologists better protect important wildlife habitats.
- 📍 maps of the four major flyways in North America.
- 📍 information on modern bird tracking techniques.

TOPIC BACKGROUND

Many species of birds undertake a cyclical seasonal journey or migration. No matter where birds travel to or from, bird migration is typically thought of as a north-south movement. Additionally, routes along coastlines, mountain ranges and major river valleys are generally heavily populated with different bird species. The four major flyways or bird migratory routes in North America are the Atlantic, the Mississippi, the Central, and the Pacific flyways.

The Atlantic Flyway extends north and south along the eastern seaboard of the United States and Canada. Routes considered part of this flyway curve northwest beginning around the Allegheny Mountains, crossing the prairie provinces of Canada and the Northwest Territories until reaching the Arctic. Mallard ducks, tundra swans, bald eagles, red-tailed hawks and Canadian geese are among the millions of birds that travel the Atlantic Flyway.

The routes of the Mississippi Flyway and the Central Flyway are a little simpler to follow. The Mississippi follows the Mississippi River in the United States and the Mackenzie River in Canada for the most part, from the Gulf of Mexico to the Arctic headwaters of the Mackenzie. To the west, the border of the Mississippi Flyway blurs into the eastern edge of the Central Flyway. Because this flyway has a lot of water and timberlands, it offers prime conditions to support migrating birds and approximately 40 percent of all North American migrating waterfowl and shorebirds travel along this route. Sometimes called "the flyway of the Great Plains," the Central Flyway begins on the northwest Arctic coast and continues slightly eastward down the central plains region between the Rocky Mountains and the Mississippi River valley to the Gulf of Mexico.

The territory of the Pacific Flyway encompasses the western Arctic region – including the Alaskan and Aleutian islands – and extends from Alaska down to Patagonia in South America. There are many important stops for bird populations along the way, including Boundary Bay in Canada, San Francisco Bay, Monterey Bay and the inland Salton Sea.

VOCABULARY

Environment

all abiotic or biotic factors that surround and affect the survival and development of an organism or a population of organisms

Ecosystem

a community of plants, animals and other organisms that interact with one another and with their nonliving environment

Flyway

an established, seasonal geographic route followed by birds during their migration to or from feeding or breeding grounds

Habitat

the type of environment in which an organism or group normally lives or occurs

Migrate

to pass from one region or climate to another periodically for feeding or breeding purposes

Species

a biological classification consisting of individual organisms capable of interbreeding with one another

Season

one of the four common divisions of the year -- spring, summer, fall or winter

PRE-VIEWING

- What are some migrating animals? Where do they go? Why do they migrate?
- How do you think humans affect migrating animals?

VIEWING FOCUS

NOTE: You may choose to watch the television segment twice with your students: once to elicit emotional responses and get an overview of the topic and again to focus on facts and draw out opinions.

- How might understanding the routes that birds fly help scientists better protect and preserve wildlife habitat?
- What makes the San Francisco Bay Area an important migration area? What kinds of bird species migrate through this region?
- What are some tools that different bird species use to navigate through migration?
- How might changes in habitat and climate affect a bird's migratory patterns? What problems could occur because of this?

For all media see:

- Segment Summary Student Sheet
http://www.kqed.org/quest/downloads/QUEST_SegSum_StudentSheet.pdf
- Personal Response Student Sheet
http://www.kqed.org/quest/downloads/QUEST_PersResp_StudentSheet.pdf

LESSON PLANS and RESOURCES from QUEST, PBS and NPR

Investigating the Mysteries of Bird Migration NPR

<http://www.npr.org/templates/story/story.php?storyId=113663006>

This October 9, 2009, broadcast from NPR's **Talk of the Nation** discusses such details of bird migration as how migrating birds orient themselves, what bird banding can tell scientists about the lives of birds and how scientists track migrating bird species.

Tracking Device Reveals Songbirds' Travels NPR

<http://www.npr.org/templates/story/story.php?storyId=100539101>

This February 9, 2009, story from **All Things Considered** investigates a new tracking device that is helping biologists learn more about migrating songbirds. Also discussed are some of the details that have emerged about songbirds thanks to this new technology.

Migration of the Monarch Teachers' Domain

<http://www.teachersdomain.org/resource/tdc02.sci.life.reg.monarch/>

Taken from **NOVA**, this video segment captures the annual migration of the Monarch butterfly and discusses how and why this species treks thousands of miles every year.

Earth Navigators PBS

<http://www.pbs.org/wnet/nature/episodes/earth-navigators/introduction/2929/>

In this episode, **Nature** follows some of the world's most amazing animal travelers in their epic annual voyages. African wildebeest, Arctic tern and the Monarch butterfly are among the species shown in the video.

Signs of Migration Teachers' Domain

<http://www.teachersdomain.org/resource/kqed07.sci.life.lpladybug/>

In this lesson, students will examine key elements of migration for different animal species and present their findings to the rest of the class.

Discuss The Great Migration story on the QUEST Blog QUEST

<http://www.kqed.org/quest/blog/2010/05/04/producers-notes-the-great-migration/>

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East Bay Regional Park District
www.ebparks.org

Exploratorium
www.exploratorium.edu

Girl Scouts of Northern California
www.girlscoutsnorcal.org

Golden Gate National Parks Conservancy
www.parksconservancy.org

The J. David Gladstone Institutes
www.gladstone.ucsf.edu

Lawrence Berkeley National Laboratory
www.lbl.gov

Lawrence Hall of Science
www.lawrencehallofscience.org

Monterey Bay Aquarium
www.mbayaq.org

Monterey Bay Aquarium Research Institute
www.mbari.org

Oakland Zoo
www.oaklandzoo.org

The Tech Museum of Innovation
www.thetech.org

UC Berkeley Natural History Museums
<http://bnhm.berkeley.edu/>

U.S. Geological Survey
www.usgs.gov

MORE EDUCATIONAL RESOURCES FOR USING QUEST MULTIMEDIA TO ENHANCE 21st CENTURY SKILLS IN TEACHING AND LEARNING

Why Use Multimedia in Science Education?

<http://www.kqed.org/quest/downloads/QUESTWhyMedia.pdf>

- Read about the importance of using multimedia in the 21st century science classroom.

How to Use Science Media for Teaching and Learning

<http://www.kqed.org/quest/downloads/QUESTMediaTips.pdf>

- A collection of tips, activities and handouts to actively engage students with multimedia.

Science Multimedia Analysis

<http://www.kqed.org/quest/downloads/QUESTMediaAnalysis.pdf>

- Give your students the tools to recognize the purposes and messages of science multimedia.

Create Online Science Hikes with Google Maps

http://www.kqed.org/quest/files/download/52/QUEST_ExplorationCreation.pdf

- Do you like the science hike Explorations on the QUEST site? Use this place-based educational guide to create similar science-based maps with youth.

OTHER WAYS TO PARTICIPATE IN QUEST



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**KQED 88.5 FM San Francisco &
89.3 FM Sacramento
Mondays at 6:30am and 8:30am**



WATCH

**KQED Channel 9
Tuesdays at 7:30pm**

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