



# Citizen Science

## Overview

Students will become “citizen scientists” by participating in an on-going research project of local bird populations and sharing their data.

## California Content Standards

Grade 6: 7.b.-I&E

Grade 7: 7.a.b.-I&E

## National Standards

Content Standard A:  
Scientific Inquiry

## Materials Include

\* Student Journal

## Materials Needed

- \* Research materials (computers, books, articles, etc).
- \* Computer Lab (“Citizen Science” website)

## Activity Time

Preparation: 15 min.  
Activity Time: 45 min.

## Best Season

All Season

## Vocabulary

\* Citizen Science

**Grade Level:** 4th-12th (C.S.S: 6th-7th)

## Learner Objectives

Students will:

- Describe how “citizen science” can help birds
- Research “citizen science” on-going research projects
- Participate in a citizen science project

## Background Information

To facilitate understanding of the natural world, professional scientists have initiated a citizen partnership. Within this partnership, citizen science practitioners including retired scientists, educators, community groups, and student groups engage in bird study by contributing their personal bird data, observations, and studies to on-going research projects. This data can become a part of a national database which can help research scientists answer ecological questions about bird populations and use results in conservation.

Researchers at Cornell Lab of Ornithology (CLO) encourage others to participating in “citizen science.” With support from the National Science Foundation, CLO has begun a variety of different “citizen science” projects including The Bird House Network, Birds in Forested Landscapes, Urban Bird Studies, Pigeon Watch, eBird, and Backyard Feederwatch.

Each project provides easy-to-follow instructions describing how to count and observe birds in a particular area. Students are encouraged to participate and become “citizen scientists” especially if they have completed one or more of the other kit lesson plans. This way students can use their new skills as bird biologists and share their science data with scientists and truly help birds! See *Counting Birds* lesson plan to get students involved in citizen science action.

# Lesson Plan

## Getting Ready!

1. Read the background information and teacher tips
2. Determine computer research site for students.
3. Make copies of the *Student Journal: Citizen Science* sheets.

## Discuss!

1. Explain to students that professional scientists need their help with bird study projects. *Birds are threatened by the introduction of non-native species, pollution, habitat loss, and disease. Scientists need to know about the different birds found in their town. As more bird observations are shared, more questions about bird populations can be answered.*
2. Ask students if they ever watch birds and if they can think of any ideas that would help scientists with their studies?
3. Write ideas on the board.
4. Let students know that they will begin their journey of becoming citizen scientists– one of the most important groups of people in science today! (You may elicit responses such as “What is a citizen scientist?” or “Huh?”).
5. Explain to students that a citizen scientist helps professional scientists study birds or other wildlife. For instance, just by watching and observing birds you can help scientists study birds. At this point you may have covered some of the bird activities such as *Counting Birds*. Let students know that they can share their science data such as bird counts with scientists and truly help birds.
6. Explain to students that there are different projects scientists are working on that could use their help.
7. List some of the projects.
8. Have each student pick one to research for the day or week.

## Investigate!

1. Give each student a Student Journal.
2. Take students to the computer lab to research.
3. Direct students to the Cornell Lab of Ornithology website: <http://www.birds.cornell.edu/>
4. Have students click on “Lab Programs” & then “Citizen Science”.
5. Have students fill out their Student Journal sheets. You may also ask students to share information as a poster, presentation, or a written description.
6. Students are now ready to start a project & become citizen scientists!

## Follow-up!

1. Ask students a few questions to recap the lesson (see right panel).

## Connections!

Use with Lesson Plans:

- \* *Counting Birds*
- \* *BRBT Habitats*
- \* *Binoculars Bonanza!*



## What is a Citizen Scientist?

A person who helps professional ornithologists study birds by sharing her bird observation data.

## Suggested Questions

*How can you help bird populations in your area?*

*What is citizen science?*

*What kinds of projects does Cornell Lab of Ornithology have that help bird populations?*

# Teacher Tips

## Cornell Lab of Ornithology

**The Birdhouse Network:** The Birdhouse Network began to help scientists understand more about bird breeding habits. Participants place nest boxes or birdhouses in their yard or schoolyard and monitor the nests inside. Information gathered by the participant includes the number of eggs and young raised in the nest. Then this information is submitted to scientists over the internet.

**eBird:** eBird documents bird abundances and distribution in a particular area or region. Participants submit bird observations of species name and numbers detected and birding information such as when, where, and how they went birding. This information is then filtered by a bird scientist expert and made available to other educators, students, and scientists.

**Project Feederwatch:** Project Feederwatch is a winter-long survey of birds that visit feeders at backyards, nature centers, and community areas. The Feederwatch runs from November through early April. With the help of participants, scientists can more easily identify winter bird populations and long-term trends in abundances.

**Urban Bird Studies:** Urban Bird Studies is a group of projects to help scientist learn about birds found in urban areas. Participants count number of birds seen and observe bird behavior.

**PigeonWatch:** Participants observe neighborhood pigeons and submit their data to scientist over the internet. Information recorded include number of pigeons and courtship behaviors.



Students counting and recording number of birds at Denman Wildlife Refuge, OR.



The screenshot shows the eBird website interface. At the top, there is a greeting: "Hello, Steve Kelling. If you're not Steve Kelling click here. Sign out". Below this is a navigation bar with tabs: "ABOUT EBIRD", "SUBMIT YOUR OBSERVATIONS", "VIEW AND EXPLORE DATA", "MY EBIRD", and "CONTACT US". The "SUBMIT YOUR OBSERVATIONS" tab is active. The main content area is titled "Submit your observations" and includes a photo of a bird. Below the title, it says "Tell us where you were birding, how you were birding, and what you recorded. Get started below!". There are two columns of options: "For Existing Locations" and "For New Locations". The "For Existing Locations" column includes "Choose from My Locations" and "Choose from Birding Hot Spots". The "For New Locations" column includes "Find it on a Map", "Use Latitude/Longitude", and "Find it by City". On the left side, there is a "Quick Tools" section with "My eBird Options" (Edit my profile, My eBird Preferences, Change my password, Manage My Locations, Manage My Observations), "New to eBird?", "Why Should I eBird?", "What is My eBird?", and "eBird Tutorials".



# Birding Economics

## Overview

Students will research birding trails using various resources as well as analyze birding statistics and graphs.

## California Content Standards

Grade 6: 7.b.-I&E  
Grade 7: 7.a.c.-I&E

## National Standards

Content Standard A:  
Scientific Inquiry

## Materials Included

\* Student Journal

## Materials Needed

\* Research materials  
(computers, books, etc.)

## Activity Time

Preparation: 15 min.  
Activity Time: 45 min.

## Best Season

All seasons

## Vocabulary

\* Birding trail  
\* Economics

**Grade Level:** 7th-12th (C.S.S: 6th & 7th)

## Learner Objectives

Students will:

- Research Birding Trails using books, internet, other resources
- Analyze birding statistics and graphs based on birding data

## Background Information

Over the past 50 years, birding has become one of the fastest growing and environmentally sound outdoor recreational activities. Unlike some other recreational outdoor sports, birding often generates little ecological impact or wildlife disturbance. In addition, birding can provide substantial economic benefits to local communities. Not only do birders invest large amounts of money on birding gear such as binoculars, field guides, and spotting scopes, but they also support local businesses during their birding trips. They stay in hotels, dine in local restaurants and cafes, and join local birding tours.

According to the National Survey on Recreation and the Environment (NSRE), birding related expenses amounted to over \$23 million in 1996. In addition, an average active birder generally spends between \$1,500 and \$3,400 during their travels each year. During their travels, birders typically search for birds along birding trails. For instance, the Basin and Range Birding Trail includes a variety of different habitats supporting a range of bird populations (see BRBT Introduction). Birders from all over the country come to Alturas, California to stay and dine while searching for birds.

Birding trails are scattered across North America. Some are complete, others are in development. In general they provide opportunities for birders, naturalists, biologists, and students alike to explore diverse habitats near or away from home. They also offer distinct scenery and cultural history of the area. People of Modoc County are fortunate to have a birding trail in their backyard. It is accessible and offers students a great place to study birds and their habitats.

# Lesson Plan

## Getting Ready!

1. Read the background information & teacher tips.
2. Determine a research site for students (computers, books).
3. Make copies of *Student Journal: Birding Economics* for each student.

## Discuss!

1. Ask students if they know what “birding” is. (Hint: also called birdwatching). *Why would someone want to watch birds? Where would “birders” go to watch birds?*
2. Explain to students that “birders” or “birdwatchers” often visit birding trails because they typically have a variety of different habitats supporting many bird populations. *For instance, there is a birding trail right here in Modoc County called the Basin and Range Birding Trail. This trail stretches throughout forests, wetlands, meadows, streams/ rivers, and sagebrush. Birds such as hawks, waterfowl, finches, woodpeckers, chickadees, and hummingbirds frequent these areas.*
3. Ask students if they ever have been on a birding trail. If so, have students share experiences. Explain the Modoc Wildlife Refuge is part of the birding trail.
4. Ask students why birding trails are built in the first place. *Birding trails are built to introduce communities to educational and recreational opportunities, to increase awareness of local bird species and habitat conservation, and to provide substantial economic benefits to the local community.*
5. Ask students what are some things birders may need when looking at birds. *“Birders” often need binoculars, spotting scopes, field guides, field journals, a place to stay, food to eat, etc.*
6. Discuss economics (see right panel).

## Investigate!

1. Let students know they will be investigating “birding” & “birding economics” and how bird watching can stimulate the economy.
2. Give each student a Student Journal to complete.

## Research!

1. Let students know they will be doing a research project on Birding Trail Economics.
2. Have students pick from the list of birding trails.
3. Have students use different resources during their research.
4. Give students an ample amount of time to complete research.
5. Have students create a poster & share their project with the class.

## Follow-up!

1. Ask students 2-3 questions to recap lesson. See right panel.

## Connections!

Use with Lesson Plans:

- \* *BRBT Habitats*
- \* *Binoculars Bonanza!*

## “Economics”

Economics is the study of the production, distribution, and consumption of goods and services.

## Suggested Questions

*What is birding?*

*What kind of tools do birders use when looking at birds?*

*What are some activities Birding Trails offer?*

# Teacher Tips

## Birding Trails Around the Country

1. Klamath Basin Birding Trail
2. Oregon Cascades Trail
3. Great Texas Wildlife Trail
4. Great Florida Birding Trail
5. Alabama Coastal Trail
6. Oregon Coast Birding Trail
7. Maine Birding Trail
8. North Carolina Birding Trail
9. California Central Coast Trail
10. Eastern Sierra Birding Trail
11. Virginia Birding and Wildlife Trail
12. Washington State Birding Trail



### **What is birding?**

Birding is the observation or study of birds with the naked eye or by a visual enhancement such as binoculars. Birders, the people who participate in birding, generally use field marks, habitat, nesting, behaviors, and songs to identify birds.

### **Basin and Range Birding Trail**

The Basin and Range Birding Trail is a winding auto route that highlights sites for viewing birds among vast inland valleys, marshes, and forested slopes-set against the dramatic breathtaking backdrop of geologic features such as the Warner Mountains. The Basin and Range is one of the most remote places in 'The Lower 48.' It's a wild landscape where wetland basins, sagebrush uplands, and mountain ranges converge, creating diverse habitats for hundreds of birds species-from songbirds and shorebirds, to waterfowl and raptors.