Exploring eBird

Oregon State Standards
Science
4.2L.1, 4.3S.2
5.2L.1, 5.3S.2
6.2L.2, 6.3S.1, 6.3S.3
7.2E.3, 7.3S.1,
7.3S.2,
7.3S.3, 7.4D.2
8.3S.1, 8.3S.2
H.2L.2, H.2E.4,
H.3S.1, H.3S.3

Common Core Standards
Math
6.SP.B.4
6.SP.B.5
6.SP.B.5a
6.SP.B.5b
7.SP.B.3
7.SP.A.2
8.SP.A.1

ELA
RI.4.7
RST.6-8.7
RST.6-8.8
RST.6-8.9
RST.9-10.7
RST.9-10.8
RST.9-10.9
RST.11-12.7
RST.11-12.9

Vocabulary
- Citizen science
- Migration
- Species abundance
- Species distribution
- Human impact
- Resident species

Summary: Students participate in contributing data to an international citizen science project, eBird, that gathers information for bird conservation and research.

Time: 45 - 60 minutes
Note: This lesson can be used by itself or as a follow-up to a bird watching lesson such as School Yard Area Search. If used as a follow-up, students first collect data on birds in School Yard Area Search (allow for a 60 minute class) and then use those data in this lesson, Exploring eBird.

Grade Level: 4-HS
Note:: This lesson can easily be adapted to individual research projects for various age students. The attached worksheets are designed for two levels: 4th through 8th grade, and 8th-12th grade, as marked on the bottom right of the worksheet pages.

Goals
- To increase awareness of citizen science and common birds in local area
- To increase knowledge of bird population dynamics
- To gain familiarity with scientific inquiry, data collection, and graphing
- To provide science education in local schools according to state standards

Learner Objectives
Students will… .
- examine local bird populations and dynamics throughout a year cycle
- design a hypothesis about patterns in local bird populations
- examine data and practice reading graphs
- contribute data to eBird citizen science website

Materials
- List of observed bird species including date, time, location
- eBird worksheets
- Computers with internet access
- Local bird field guide (can be substituted with a bird website such as Cornell's Lab of Ornithology "All About Birds" available: http://www.allaboutbirds.org/)

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Exploring eBird

Background Information

Citizen science is a research method in which amateur or nonprofessional scientists (such as your students) can participate through data collection or analysis. Through the Cornell University's Lab of Ornithology eBird project available http://ebird.org/content/ebird/ people can participate in citizen science through making bird observations at any time or anywhere, and submitting them to the local Klamath-Siskiyou eBird site http://ebird.org/content/klamath-siskiyou.

Citizen science is a powerful tool for the public, land managers, and scientists. The help of tens of thousands of people entering data to the eBird website from all over North America provides scientists, educators, and the general public with a vast amount of current information about the birds in their specific area. This information can be used to look at **migration** patterns, **species distributions, species abundance**, and other changes or unusual occurrences, and much more. Users can look at individual observations by others or data summaries displayed in charts and graphs.

By examining the data available from eBird, we can investigate various aspects of bird biology and ecology. The birds which people are likely to see are dependent on factors like habitat preference, time of year (whether they are migratory or **resident** species), and if the visited area has had **human impact**.

Studying birds: Vocabulary

- Migration: A seasonal long-distance movement of individuals
- Species distribution: The geographic area in which a species is found
- Species abundance The relative number of individuals from one species in an ecosystem, as compared to all species found in an ecosystem
- Resident species: A species which remains in an area throughout the yearly cycle. Opposite of *migrant species*.
- Human impact: Human influences on the natural environment, usually referring to negative effects such as resource degradation, pollution, or habitat destruction.

Getting Ready

1. Create an eBird account
2. Plan and go on a local bird walk to gather data to input into eBird using the included "Bird Area Search Data Sheet." Make sure to record the date, time, location, species found. *Or* if students are proficient in identifying birds, have them spend time observing birds at a local location as homework so each student has an individual bird list.

Make an eBird account :

https://ebird.org/ebird/CheckUserLogin

Citizen Science

⇩

More data

⇩

Better science

eBird is one of the largest and fastest growing biodiversity data resources in existence. Participants report millions of bird observations each year.

Citizen science

⇩

Civic engagement/ education

⇩

Informed public

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Discuss!

1.Introduce the idea of citizen science. Ask students how it differs from other ways in which science is conducted.

2.What are advantages of citizen science? Larger data sets, which represent trends and a "bigger picture" of what is going on with birds. What are disadvantages? Data may not be as accurate as if obtained by trained scientists.

3.Have students write down a hypothesis about: the data they will be entering as compared to past years' data. Encourage them to think about influences such as weather, vegetation, and human influences. For example: are migratory birds arriving earlier or later than last year? Have they seen any species that are rare? What time of year will you see the most birds?

Investigate

1. Have students log into eBird and enter their data.

2. Allow students to look at the local information for the local area by clicking on "Explore Data" and scrolling down to "Line Graphs." How does their data compare to past information? Are there any similarities or differences? Encourage students to state if their hypothesis is supported or not supported by the information on eBird from past years.

3. Allow students to choose two birds to look up on eBird. Guide students through an exploration of eBird using the Exploring eBird Data worksheet (either for 4th-8th grade or 8th-HS as noted on the bottom right corner of the worksheet.)

<u>eBird Celebrates 100 millionth data submission, by 12 year-old boy:</u>

On 8 August 2012, Liron Gertsman of Vancouver, British Columbia, submitted the 100 millionth observation to eBird. It was of an American Robin; one of 24 species that Liron saw at the Maplewood Conservation Area that day. The director of the Cornell Lab of Ornithology, John Fitzpatrick said, "This is a true milestone in the history of field ornithology and citizen science. The power of so much data is only just beginning to be recognized around the world…. we are starting to discover some amazing new patterns about the natural world thanks to all these thousands of volunteer observers."

Text and picture from eBird website August 13, 2012 http://ebird.org/content/klamath-siskiyou/news/100000000r

What is eBird?

- A real-time, online checklist program, eBird
- Launched in 2002 by the Cornell Lab of Ornithology and National Audubon Society
- Provides data sources for basic information on bird abundance and distribution at a variety of scales.

eBird is designed for everyone!

No need to worry if your students' data is good enough. Accurate data is important, but eBird is designed for beginning birders and experts alike.

Professionals at the Cornell Lab of Ornithology have designed the eBird program to evaluate the vast amount of data entered each year, and you have the tools to help your students make the cut, every time.

Check out eBird information specially designed for schools available at:

http://ebird.org/content/birdsleuth

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Exploring eBird

Conclusion

1. Have students share information about the individual birds. Use an overhead to project the computer screen for different bird species from eBird, or record findings on a graph on a whiteboard/chalkboard.
2. Encourage students to think about reasons why they saw the birds that they did. Ask students why certain birds are seen at certain times of year, or in different locations.
3. Ask students to brainstorm a list of birds that they might see if they went back to the same location at a different time of year, or if they went out again soon to a different location. (Use field guides if time permits)
4. Wrap up the discussion by asking what students think about citizen science, and if they can think of any other science projects that would be able to use citizen science.

Extensions

- This activity is great to do multiple times throughout a school year in order to observe seasonal changes of birds and the local environment, and gain deeper knowledge of a working with data.

Link to KBO lessons

- **Field Journals** - students learn to keep records of their natural history observations in a field journal
- **Study Skins Activity** - students learn to identify birds using field marks and using field guides
- **Schoolyard bird search** - students learn about local birds and record sightings on an observation sheet

Further Resources

- For more information on birds, research and citizen science explore Cornell's Lab of Ornithology website at http://www.birds.cornell.edu/ and for more information about youth and science research visit: http://ebird.org/content/ybn

Get the data!

Access eBird data from thousands of "eBirders" - great for math lessons, biology studies, and student research projects!

Here's how:

1. From your eBird home page, go to 'Explore Data,' click on 'Download Data' in the bottom right corner of the page

2. Fill out the data request form to get a 'key' to the download tools

3. Use the tools to download prepackaged datasets or to create your own queries based on species, date range, and region

You'll be notified by email when your data are ready for download (usually within a few minutes)

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Name:_____

Date:_____

Bird Area Search Data Sheet

Location: _____ Habitat: _____

Start Time: _____ End Time: _____ Weather: _____

Other site observations: _____

Accipiter:_____

Blackbird, Brewer's:_____

Blackbird, Red-winged:_____

Bushtit:_____

Chickadee, Black-capped:_____

Crow, American:_____

Dove, Mourning:_____

Finch, House:_____

Finch, Purple:_____

Flicker, Northern: _____

Flycatcher, Willow:_____

Goldfinch, American:_____

Goldfinch, Lesser:_____

Goose, Canada: _____

Hawk, Red-tailed:_____

Hummingbird, Anna's:_____

Hummingbird, Rufous:_____

Jay, Steller's: _____

Junco, Dark-eyed:_____

Kinglet, Ruby-crowned:_____

Kestrel, American:_____

Mallard: _____

Phoebe, Black:_____

Pigeon, Rock:_____

Quail, California:_____

Raven, Common:_____

Robin, American: _____

Scrub-Jay, Western:_____

Siskin, Pine:_____

Sparrow, Fox:_____

Sparrow, House: _____

Sparrow, Golden-crowned:_____

Sparrow, Song:_____

Sparrow, White-crowned:_____

Starling, European:_____

Swallow, Barn:_____

Swallow, Cliff:_____

Swallow, Tree:_____

Swallow, Violet-green:_____

Swift, Vaux's:_____

Thrush, Hermit:_____

Towhee, California:_____

Towhee, Spotted:_____

Vulture, Turkey:_____

Waxwing, Cedar:_____

Woodpecker, Acorn:_____

Woodpecker, Pileated:_____

Warbler, Yellow-rumped:_____

Warbler, Yellow:_____

Warbler, Orange-crowned:_____

Other species observed:

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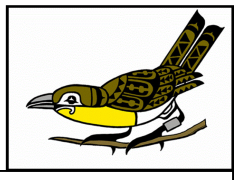
Name:_____
Date:_____



Exploring eBird Data : Line Graphs

Bird #1

1. From the Klamath-Siskiyou eBird home page, click on "My eBird."

2. Click on "Explore Data" at the top of the page. Scroll down and click on "Line Graphs."

3. Type the name of bird #1 _____ in the box. Click "continue."

4. What does the x-axis of the graph represent? _____

5. What does the y-axis represent? _____

6. In what month were there the most sightings of this bird?_____

7. What percent of all observations took place during this month? _____

8. Based on this information, do you think this bird is usually found in our area (circle one):

year round *during breeding* *during winter* *during migration?*

9. Look up this bird in your field guide. When is this bird found in our area? Use the key on page 32 or an online bird field guide (http://www.allaboutbirds.org) to understand what the colors mean.

_____

10. Does this information match what you see on the graph? _____

11. If not, what else could explain what you see on the graph?

_____

_____

_____

12. If this bird is usually found in our area during the winter, where does it spend the breeding season (summer)?

_____

13. If this bird is usually found here during the breeding season (summer), where does it spend the winter?

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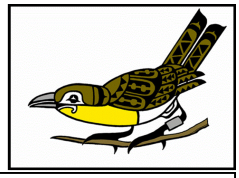
Name:_____
Date:_____



Exploring eBird Data (continued)

Bird #2

Name of Bird: _____

1. Enter the name of your second bird bird. Click "continue." Make sure that you have un-checked all of the other birds that appear.

2. In what month were there the most sightings of this bird?_____

3. What percent of all observations took place during this month? _____

4. Based on this information, do you think this bird is usually found in our area (circle one):

year round *during breeding* *during winter* *during migration?*

5. Look up this bird in your field guide. When is this bird found in our area? Use the key on page 32 or an online bird field guide (http://www.allaboutbirds.org) to understand what the colors mean.

_____

6. Does this information match what you see on the graph? _____

7. If not, what else could explain what you see on the graph?

_____

_____

_____

8. If this bird is usually found in our area during the winter, where does it spend the breeding season (summer)?

_____

9. If this bird is usually found here during the breeding season (summer), where does it spend the winter?

_____

Bonus Questions!! If you have extra time, explore eBird and answer these questions.

How many species are on the Klamath-Siskiyou eBird *Life List*? _____

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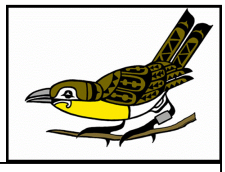
Name:_____
Date:_____



Exploring eBird Data

From the Klamath-Siskiyou eBird home page, click on "My eBird." Click on "Explore Data" at the top of the page. Scroll down and click on "Line Graphs."

1. Type the name of a local bird species _____ in the box. Click "continue."

2. What is the difference between the two following ways of measuring bird populations?

   Frequency: _____

   Abundance: _____

3. In what month were there the most sightings of this bird?_____

4. What percent of all observations took place during this month? _____

5. Use a guidebook or http://www.allaboutbirds.org, determine when is this bird found in our area:

_____

6. Does this information match what you see on the graph? _____

7. If not, what else could explain what you see on the graph?

_____

_____

_____

8. Which month had the largest amount of checklists submitted? (i.e. "sample size") _____

   Does this influence your answer to question #7? If so, explain_____

_____

9. If this is a migratory bird, where does it spend the other parts of its lifecycle?

_____

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Klamath-Siskiyou eBird:
Get Started Now!

eBird is a real-time, online checklist program that has revolutionized the way the birding community reports and accesses information about birds.

Get Online. Type into Your Browser:
www.eBird.org/Klamath-Siskiyou

View Homepage.
- Read recent articles about birds and the Klamath-Siskiyou Ecoregion.
- See local eBird submission summaries.
- Register as a New User!

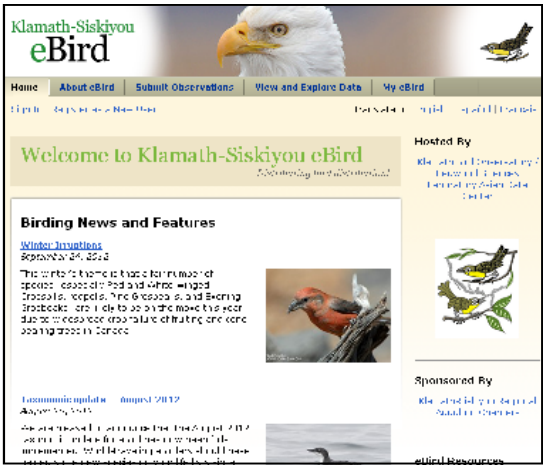
Click "About eBird" Tab.
Learn more about eBird and why you should participate.

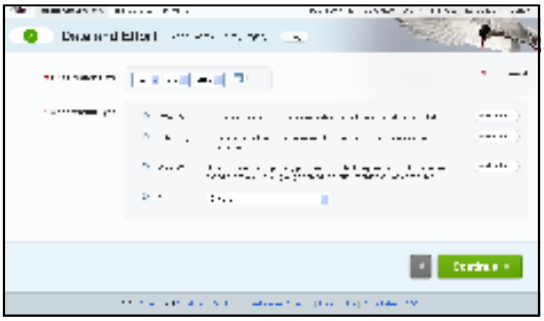
Submit Observations.
Entering your data!
Enter data from anywhere in the Americas.

1) Enter location using one of these options:
- "Select from My Locations"- Select from previously entered locations.
- "Find it on a Map"- Select on interactive map using Google Earth.
- "Use Latitude/Longitude"- Type in location coordinates from a map or GPS unit.
- "Select an entire city, county, or state"- Type in a location or select a hotspot.
- "Import Data"- Import from spreadsheet or database.

2) Date and Effort:
- Select observation type, date, start time, and other details about your trip.

3) What did you see or hear:
- Put in your bird checklist data
- Best to include numbers.
- Enter notes about your trip.





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Klamath-Siskiyou eBird:

View and manage your bird watching records with eBird! Explore eBird data with summary tables, graphs and maps.

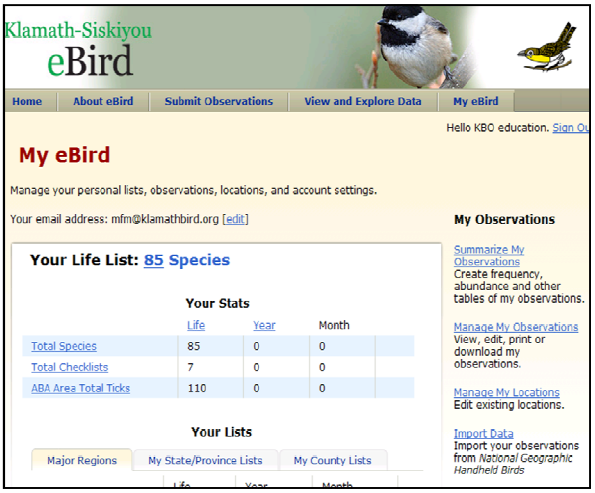
My eBird Tab.
Check on your personal lists, observations, locations, and account settings.

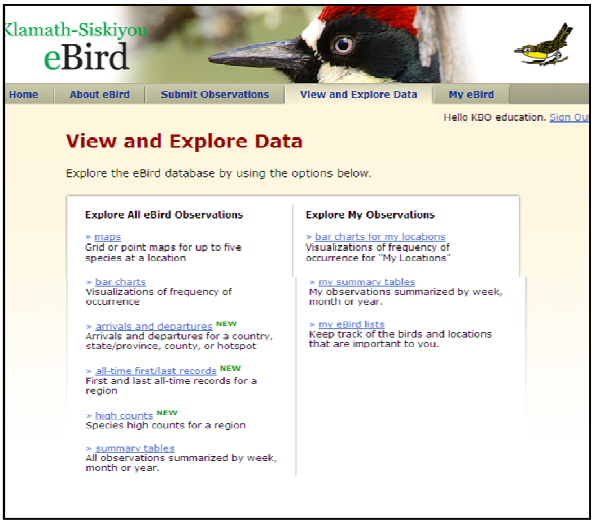
1) Review the following:
- "Your Life List"
- "Your Stats and Lists"- Summary stats about the places you have been and birds you seen.
- "My Observations"- view, edit, print or email your observation with lists, graphs and maps.
- "Account Settings"- edit your profile and eBird preferences.

2) View and Explore Data Tab.
Investigate data that has been entered by all eBirders and scientists.

3) Explore all eBird Observations:
- "Maps"- Create local, regional and national maps for one or more species.
- "Bar Charts"- chart species occurrence over time.
- "Arrivals and Departures"- learn about recent comings and goings.
- "All-time First/last records"- learn about when to expect birds to come and go.
- "High Counts"- see high counts for a specific area.
- "Summary Tables" summarize all observations by week, month, or Year.

4) Explore My Observations:
- "Bar Charts for my Locations"- visualize occurrence of species at "My Locations."
- "My Summary Tables"- summarize your observations by week, month, or year.





Klamath-Siskiyou eBird is a collaborative project sponsored by the Klamath Bird Observatory-Redwood Sciences Laboratory Avian Data Center, Klamath-Siskiyou Regional Audubon Chapters and the Cornell Lab of Ornithology.

Klamath Bird Observatory
P.O. Box 758
Ashland, OR 97520
www.Klamathbird.org
Questions: eBird@KlamathBird.org

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