

"Counting Birds"

Mr. Mark Musselman

Audubon at the Francis Beidler Forest

Overview: The Great Backyard Bird Count (GBBC) is an annual four-day event that engages bird watchers of all ages in counting birds to create a real-time snapshot of where the birds are across the continent. Anyone can participate, from beginning bird watchers to experts. It's free, fun, and easy—and it is hands-on science that helps the birds and provides plenty of data to manipulate!

Connection to the Curriculum:

Math

- K-6.2 Interpret data in graphic displays in the form of drawings and pictures.
- 1-6.2 Organize data in picture graphs, object graphs, bar graphs, and tables.
- 1-6.3 Interpret data in picture graphs, object graphs, bar graphs, and tables by using the comparative terms more, less, greater, fewer, greater than, and less than.
- 2-3.4 Identify quantitative and qualitative change over time.
- 2-6.3 Infer trends in a data set as increasing, decreasing, or random.
- 3-6.2 Organize data in tables, bar graphs, and dot plots.
- 3-6.3 Interpret data in tables, bar graphs, pictographs, and dot plots.
- 4-6.2 Interpret data in tables, line graphs, bar graphs, and double bar graphs whose scale increments are greater than or equal to 1.
- 5-6.2 Analyze how data-collection methods affect the nature of the data set.
- 6-2.1 Understand whole-number percentages through 100.
- 6-6.1 Predict the characteristics of one population based on the analysis of sample data.
- 7-2.1 Understand fractional percentages and percentages greater than one hundred.
- 8-1.7 Generalize connections among a variety of representational forms and real-world situations.
- 8-2.7 Apply ratios, rates, and proportions.
- 8-6.8 Interpret graphic and tabular data representations by using range and the measures of central tendency (mean, median, and mode).

Suggested Grade Range: K-8

Time: 45 minutes

Materials Needed:

1. Internet access to <http://www.birdsource.org/gbbc/>
2. Student data sheet

Objectives:

1. SWBAT interpret a line graph created from data in a table.
2. SWBAT interpret data when comparing two dot plot maps.

Procedures:

1. Have students navigate to the Great Backyard Bird Count webpage at <http://www.birdsource.org/gbbc/> or project the webpage for the class via a digital projector.

2. In this example, the Carolina Wren (state bird of South Carolina) will be used, but any bird species can be chosen, especially if students will have independent access to the webpage.
3. Provide each student with a copy of the student data sheet. They will need the data they collect to create a line graph.
4. Click on “Explore the Results” in the top menu bar. Select “click here” from the “Detailed Reports” box. Click on “A Particular Place.” Any town or state may be selected, but in this example Summerville, South Carolina will be used. Click on “Town,” type in “Summerville” and select “South Carolina.” The reporting results for Summerville, SC for the years 1998-2007 can be viewed from this page.
5. Begin with the year 1998 by clicking on the “1998” in the menu bar across the top of the table. There is no data for the year 1998, so students should record “0” for the number of Carolina Wrens and “0” for the number of checklists reporting the species. The total number of birds (not just Carolina Wrens) is listed at the bottom of the table. Repeat this step for the remainder of the years through 2007. Note that the species list can be shown alphabetically by selecting that option at the top of the species column.
6. At the bottom of the student data sheet, have each student create a graph for the number of Carolina Wrens reported for the years 1998-2007. Remind students that their graph should have a title (Carolina Wrens in Summerville) and that both the X and Y axes should be labeled (X=years; Y= # of Carolina Wrens). Have students plot their data by placing a dot at the appropriate intersection of the year and number of birds reported. Have students connect the data points with a line.
7. Using a different color, have students label the Y axis “# of checklists” and plot their data by placing an “+” at the appropriate intersection of the year and number of checklists. Have students connect the data points with a line.
8. Have students answer the questions on the student data sheet. “What do you notice about the relationship between the two line graphs?” (*Except for 2007, there is a direct correlation between the number of Carolina Wrens seen and the number of checklists reporting. The more checklists, the more Carolina Wrens that were seen.*) “How does the data for 2007 rank? (Is it 1st, 2nd, 3rd, etc.)” (*Between 1998 and 2007, the # of Carolina Wrens is 3rd, the # of checklists is 3rd, the total # of birds is 5th, and the percentage of the total is 1st.*) “What do you think is the reason for the “up and down” numbers for Carolina Wrens in Summerville, SC?” (*Answers will vary, but may include less participation [fewer checklists]; natural populations cycles due to fluctuations in the weather, food supplies, disease, habitat loss; poor weather during the reporting weekend which kept birds under cover and hidden, etc.*)
9. Show students the dot maps for American Robins in 2000 and in 2007. Ask students to describe the differences (*more pink >15; more distribution in the Midwest and Northwest*). Ask students if they can assume that there are more American Robins based solely on the two maps. What other information would be helpful in evaluating the data? (*No, because as the Carolina Wren data showed, fewer people participating tends to lower the number of birds reported in a species and overall. Poor weather in 2000 could have forced birds farther south or kept them hidden from view. For example, it has been shown that as snow gets deeper it is less likely that American Robins will be spotted. Looking at the maps might signal a trend, but other data (# of checklists, % of total, weather during the count, etc.) need to be considered before stating that the number of American Robins increased in 2007.*)

Suggested Evaluation:

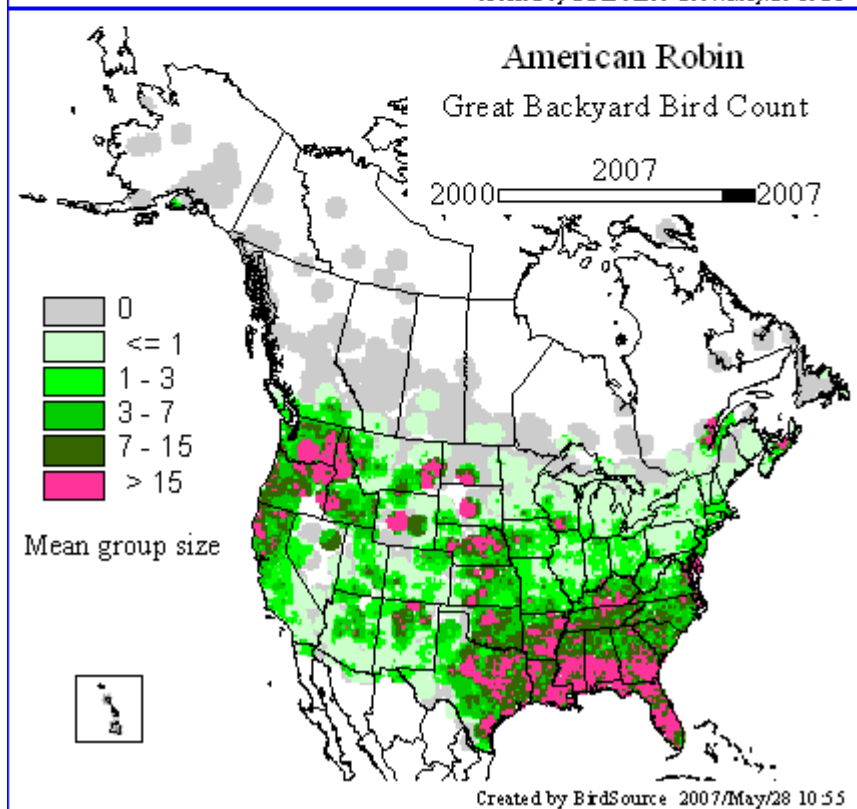
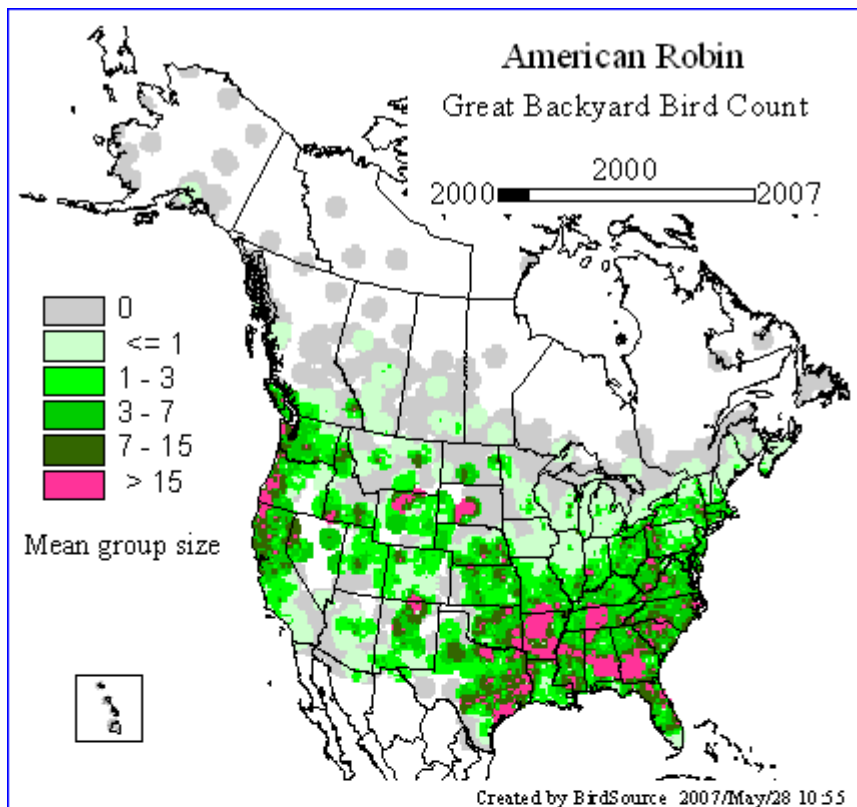
1. Create a rubric for the line graph based on the grade level of the student and the standards being addressed.
2. Using a graph like the Carolina Wren graph in this lesson, ask students, “If 25 checklists are submitted in 2008, the number of Carolina Wrens reported should be higher or lower than 25?” (*Based on the data, the number of Carolina Wrens has never been lower than the number of checklists submitted, so “higher” would be the reasonable answer.*)

Extending the Lesson:

1. Participate in the Great Backyard Bird Count (GBBC) and compare the data the students collect with data from previous years. The students can report the data to the GBBC website from home or at school, while any observations by students at school can be tallied together and reported as one set.

Resources:

1. Great Backyard Bird Count at <http://www.birdsource.org/gbbc/>
2. Audubon South Carolina at <http://sc.audubon.org/>



Digital copies can be found in the GBBC map room.

Name: _____

Carolina Wrens in Summerville, SC

Year	# of Carolina Wrens	# of checklists	Total # of birds	% of C. Wrens to total

1. Enter the Carolina Wren data into the table.
2. In the space below, create and label an X axis and Y axis to graph the data.
3. Plot the “# of Carolina Wrens” using a dot and then connect the points with a line.
4. Using a different color, plot the “# of checklists” using a “+” and then connect the points with a line.
5. What do you notice about the relationship between the two line graphs?
6. How does the data for 2007 rank? (Is it 1st, 2nd, 3rd, etc.)
7. What do you think is the reason for the “up and down” numbers for Carolina Wrens in Summerville, SC?

Completed table and graph for Carolina Wrens in Summerville, SC

Year	# of Carolina Wrens	# of checklists	Total # of birds	% of C. Wrens to total
1998	0	0	0	0
1999	2	1	107	>1
2000	30	21	2635	1.1
2001	12	9	1416	>1
2002	13	6	728	1.7
2003	26	14	2187	1.1
2004	5	3	517	>1
2005	37	20	1338	2.7
2006	8	6	563	1.4
2007	35	16	1093	3.2

