

Activities to Go

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In every issue of The Science Reflector look for this new section including activities you can use in your classroom tomorrow. If you have activities you would like to share [please email the editor](#).

This issue features winning lessons from the **Renaissance Computing Institute's Lesson Plan Competition**. RENCI Education and Outreach programs seek to help all North Carolinians gain access to 21st-century technology tools, fully participate in using these tools for education, scientific discovery, and artistic expression, and actively contribute to creating and implementing new technologies as citizens of a knowledge age global economy. RENCI Education and Outreach methods stress hands-on, interactive learning using innovative curricula, professional development and training, and collaboration among educators, scientists, technologists, community leaders, students and life-long learners.

Learn more about the [RENCI Weather Web Program](#) and [NC-FIRST](#).

Migration Dates of Outer Banks Waterfowl

Average and Instantaneous Speed

Bonus! The Farmer Grows a Rainbow - The latest lessons for PreK through 5th grade from North Carolina Ag in the Classroom plans based on the newest dietary guidelines. [Learn more...](#)

They're Coming! Migration Dates of Outer Banks Waterfowl

From the [RENCI Lesson Plan Competition](#)

Rita Thiel, 4th Grade Teacher, Ocracoke School, Hyde County

Lesson Description

This lesson involves the tracking of temperature data to try to predict the migration dates of several species of migratory waterfowl. Students research the northern ranges of several species of waterfowl that are seasonal residents of the Outer Banks. Species included here are the Tundra Swan, Snow Geese, and the Bufflehead duck. Temperature data is then gathered on these northern areas, and graphed on a line graph. This data is taken concurrently with daily local temperature data, which is also graphed. Temperature data is gathered over an extended period of time, so trends can be observed, and predictions made for the birds' arrival dates.

Objectives

Use technology to track and record temperature data for the northern ranges of a species of migratory waterfowl. Research the northern habitat ranges of several species of migratory waterfowl. Analyze sets of temperature data, and make predictions for migration dates. Gain an understanding of how weather and climate are factors in the survival of living organisms.

North Carolina Standard Course of Study

Fourth Grade Science Competency Goal 1: Make observations and conduct investigations to build an understanding of animal behavior and adaptation

Fourth Grade Science Competency Goal 1.01: Observe and describe how non-living things affect the life of a particular animal, including weather and climate.

Classroom Time Required

Research of species' northern ranges: 1-2 class periods

Recording of daily temperature data: 10-15 minutes daily, on-going for 6-8 weeks

Materials needed

Bird identification guide books with migratory range maps

Background information on the species being tracked

Internet resources to track northern range temperatures (resource list follows)

Data charts (student generated or graph paper) to record temperatures

Pre-activities

Students should know how to record high and low temperature data, read a species range map, and have a general understanding of the terms migration/migratory.

Teachers should familiarize themselves with the website resources for recording northern range temperatures.

Teachers should also be familiar with several species of migratory waterfowl for their area.

Activities

1. Students work in teams of 2-4 to research the northern and southern range of a particular species of migratory waterfowl. Research continues to find how long it generally takes for the bird to follow its migration route, and what kinds of hazards or challenges it faces along the way.
2. Once the northern range has been located, students should begin to record the temperature data from that area. Daily readings should be recorded, using a weather data website. Temperatures are then graphed on line graphs.
3. Students also record the daily local temperature, and add to a separate line graph.
4. As temperature data is collected each day, have students look for trends in the northern ranges that might signal migration times beginning.
5. Students begin to make predictions of when their species will arrive in the Outer Banks, given the temperature conditions up north.
6. Student teams make a timeline of activities their bird might be involved in, in preparation for its migration (extra feeding, gathering in groups, distance flown each day).
7. Student teams design a visual representation of their species along with the migration data. Student teams can present this data, explaining the factors influencing their species' migration.

Evaluation

Student assessment involves evaluation of the research completed on the species of waterfowl, and the accuracy of the information. Teams will be assessed on the continuity of data collection, reasonable predicting of migration dates, generation of a "pre-migration" timeline, and a visual representation of their species and its migration data. Temperature data and the line graphs will be assessed for accuracy and neatness.

Follow-up Activities

Take a fieldtrip to Pea Island National Wildlife Refuge to observe the species of waterfowl as they arrive in the fall.

Resources

The Sibley Field Guide to Birds of Eastern North America

http://en.wikipedia.org/wiki/Bird_migration : Gives information on species' migration routes

www.nc-climate.ncsu.edu/cronos: State Climate Office of NC CRONOS Database

www.worldclimate.com: Weather data, worldwide

www.mcdc.noaa.gov/oa/mcdc.html : This site covers surface marine observation data

www.rap.ucar.edu/weather: From the National Center for Atmospheric Research, operated by the University Corporation for Atmospheric Research, includes satellite views, surface weather, radar images, and upper-air conditions

Average and Instantaneous Speed

From the [RENCI Lesson Plan Competition](#)

Lesson Description

In this lesson students differentiate between instantaneous speed and average speed using data from a local weather station. Students plot a line graph using local weather data (wind speed at the beginning of each hour for the last 7 days). Next, they calculate average wind speed each day for the past seven days. They produce a bar graph using this data. Last, students mark wind speed at the instant they complete their graph. This lesson illustrates the difference between average and instantaneous speed. Students also have the opportunity to make several types of graphs and compare a bar versus a line graph.

Objectives

- Describe the difference between speed, velocity, and acceleration.
- List examples of constant speed, average speed, and instantaneous speed using wind speed data.
- Explain when it is appropriate to use a bar graph and a line graph.
- Produce accurate line and bar graphs showing wind speed.
- Calculate average speed after collecting data from a chart. Calculate speed using a line graph (rise over run).

North Carolina Standard Course of Study

Physical Science Competency Goal 1.02: Design and conduct scientific investigations to answer questions about the physical world.

Physical Science Competency Goal 2.01: Measure and mathematically/graphically analyze motion.

Classroom time required

This project should take about one class period (block schedule).

Materials needed

Wind speed data
Calculator
Ruler
Colored pencils
Graph paper

Pre-activities

Students should have been introduced to the definitions, equations, and examples for speed, acceleration, and velocity. Students should be able to set up and produce a scientific graph. They should also have practiced calculating average speed and acceleration.

Activities

Students make two graphs using wind speed data collected hourly for the past seven days.

1. First, students make a line graph plotting the wind speed each hour for seven days. They answer a series of questions about changes in wind speed.
2. Second, students calculate the average wind speed for the past seven days. They then plot their data on a bar graph. Again, they answer a series of questions about the changes they see.
3. Last, students plot the wind speed at a specific time as a point on the line graph. This allows them to differentiate between average speed and instantaneous speed. Students answer some questions about speed at specific times on the line graph (using rise over run).

Evaluation

Students' products will be their graphs and the answers to their questions. These will be graded for accuracy. Students will be tested on the concept of average speed and instantaneous speed on the unit test.

Follow-up activities

Put student graphs on the Internet and use them to track wind speed data from year to year. These graphs will be available to any classes interested in analyzing wind data.

Resources

Students need access to the computer and weather station data (<http://www.nc-climate.ncsu.edu/cronos>).

The Famer Grows a Rainbow

North Carolina Ag in the Classroom has developed a set of lesson plans based on the newest dietary guidelines established by the US Department of Agriculture, MyPyramid. The lesson set is entitled “The Farmer Grows a Rainbow” and has academic lessons for each grade pre-kindergarten through fifth as well as accompanying physical activities for each grade level. The set includes a general lesson for all grade levels designed to familiarize students with MyPyramid and food group categories. Each subsequent grade level lesson integrates nutrition education with academic curricula in various subject areas. Each lesson promotes a common theme that all good food that we enjoy comes to us through the work of the farmer.

THE FARMER GROWS A RAINBOW



“The Farmer Grows a Rainbow” materials are available free of charge online at www.agclassroom.org/rainbow. All lesson plan text as well as masters for printing and patterns for lesson materials are downloadable. Videos of each lesson are also online along with a demonstration of the theme song and an instrumental accompaniment track. Educators interested in obtaining a hard-copy trainers’ kit may contact North Carolina Ag in the Classroom staff at 919-783-4319 or 919-719-7282.

All lessons are aligned with the North Carolina Standard Course of Study as well as national teaching standards. Funding for “The Farmer Grows a Rainbow” was provided by a grant from the US Department of Agriculture.

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