



Separate Vacations Lesson Plan

Overview

Sometimes you will hear people talk about family members who take separate vacations. In this lesson plan, students will discover that some birds do the same thing! Using data about two Osprey mates named X2 and X3, students will plot the migration paths of these two birds using latitude and longitude data from a table. As students compare the paths of X2 and X3, they will find out that these birds, although mates, migrate southward to different places of the Earth. After spending several months apart, their northward migrations return them back together at the same place they started.

Suggested Lesson Sequence	Please see the Migrations del Mundo and Maps and More module descriptions.
Lesson Level	Extended
Science Connections (Keywords in BOLD)	<ul style="list-style-type: none"> • Students will examine the migration routes of two Osprey mates by plotting latitude and longitude coordinates from satellite tracking data.
Math Connections (Keywords in BOLD)	<ul style="list-style-type: none"> • Students will graph points on a coordinate grid by plotting latitude and longitude. • Students will read and interpret data tables.
Lesson Assessment	<p>Assessment and Standards Table (Word)</p> <p>Assessment Activity Description (below)</p> <p>Authentic Assessments (below)</p>

Materials

Powerpoint Reader ([Windows](#) / [Mac](#)), and [Quicktime Player](#)
 Tracking the Motion slideshow ([Powerpoint](#))
 Osprey Mate Graphing Activity ([Word](#))
 Osprey Mate Graphing Questions ([Word](#))
 Scientific Data Table ([Word](#))
 Scientific Data questions ([Word](#))
 Separate Vacations movie ([Quicktime](#)), starring Pixel the Satellite

Vocabulary

Migration: Movement between two geographic areas, which is important to an animal's survival and reproduction

Migratory Path: The route an animal takes during migration

Longitude: Distance measured in degrees east or west of the meridian at Greenwich, a city near London

Latitude: Distance north or south of the equator measured in degrees

Vocabulary Note: During this lesson, students will read passages of text on the activity sheets. Students may be unfamiliar with some of the vocabulary presented in this lesson. This is done intentionally, to build reading skills and to spur additional conversations and discussion about these words and their meanings. Encourage your students to ask about unfamiliar words in the readings.

Procedure

I. Assessing Prior Knowledge

To introduce this lesson, students should review what they have learned (from the previous osprey lesson, [Osprey Journey](#)) about the migration patterns of Osprey. In particular, children should recall that osprey migrate to the same place every year. It would be nearly impossible to document this phenomenon without the use of technological tools (satellite tracking) and mathematical models (latitude and longitude coordinates). For additional review about the use of coordinate systems as a way to identify specific locations on a map, the [Search and Rescue](#) lesson plan develops students' understandings of coordinate grid systems, and ordered pairs. If students did not have the opportunity to view the [Tracking the Motion](#) Powerpoint slide show on animal tracking in the previous lesson, take this opportunity to do so now.

II. Contextual Preparation

After this introduction, students should be told that they will be comparing the flight paths of two birds - Osprey mates X2 (female) and X3 (male). They will do so in two ways. First, students will discover the path of the two osprey mates by graphing from the data table with coordinate systems to see a visual representation of the migration paths of X2 and X3. Second, they will examine a more complete scientific data set that has been represented in a table to see how it reveals important information about the migrations of X2 and X3.

To help introduce these concepts, show students the Pixel the Satellite movie entitled

[Separate Vacations](#). The text for the animation is included below.

(Pixel has a suitcase, which has one or two stickers plastered on its side) "1. Have you ever heard of families who sometimes take separate vacations? 2. In this next lesson, you'll meet a family that takes separate vacations every year! 3. An osprey family, that is. 4. Osprey are large, fish-eating birds that spend the summer months in the U.S. and Canada, then migrate south when the days get short and cool weather is on the way. 5. An especially interesting thing about these birds is that the male and female adults each fly to wintering grounds far far away from each other before returning to the same nest the next year. 6. How will you discover where they go? 7. Your teacher will help you with that part...in the mean time, I've got some pictures to snap over Australia! 8. See you soo-oon!"

III. Student Activity

1. Begin by giving students copies of the [Osprey Mate Graphing Activity](#). Working with a partner, students should outline the migration paths of both X2 and X3 as instructed on the activity sheet. This process is similar to the one used in the [Osprey Journey lesson plan](#). To compare the migrational routes of the osprey mates, students will plot X2's and X3's *southern* journey in red, and their *northern* journeys in blue. Students should indicate the directions of the southern and northern migrations with arrows for the migration route of each bird.
2. Beside each point, students should label the date on which the data was gathered. As they connect the dots to more easily recognize and study the flight path of the bird, they should be reminded that this line does not necessarily represent the *actual* path of the birds. All we know for sure is the location of the points a particular time. How the bird flew between the points is unknown.
3. After graphing the migration paths of the osprey mates, students refer to the graphs to answer the Osprey Mate Graphing Questions.
4. To learn more about the flight paths and locations of the osprey mate migrations, students should be given a copy of the Scientific Data Table with the more complete data set for the migration of osprey mates X2 and X3. This particular activity will focus on interpreting a data table to explain the migration patterns of the birds in relation to date, latitude-longitude, and location. The teacher may wish to read the introductory paragraphs aloud with the whole class before students begin examining the table. Referring to the Scientific Data Table, students should answer the Scientific Data Table Questions. A large group discussion of student findings and responses to the questions will be helpful in solidifying students' understanding of Osprey migration.
5. Questions for Class Discussion and Assessment

The following questions are relevant to the work that students will do on both the Osprey Mate Graphing Questions and Scientific Data Table Questions. Teachers may want to use

these general questions below as either **informal assessments of students' understanding**, or as prompts for class discussions.

1. During what dates did the Ospreys remain in the same nesting location?
6/14/96 to 8/26/96
2. During what time period did the Ospreys begin their migration southward?
9/02/96 to 9/16/96 northward? 3/22/97 to 3/24/97
3. Do the Ospreys follow the same migration path northward and southward? *no*
4. Where are the two southern homes of the Osprey? *X2 - Mazatlan, Mexico; X3 - Sinaloa, Mexico*
5. Over what states did the Osprey travel during their migrations? *Oregon, California, Texas*
6. What is different about the paths of the two birds? *X2 flies along coastal California on the southern journey and X3 flies more inland across Texas.*
7. Since Osprey X2 and X3 are mates what would you have expected their migrations to look like? Were you surprised in any way when comparing the data? *Answers will vary.*
8. If you were to email a scientist studying these two birds what would you want to ask her?
Answers will vary.
9. Do X2 and X3 migrate over the same period? Does it appear as though they travel similar distances? *No, female X2 leaves earlier and returns to the nest earlier than male X3. Also, the two birds travel different distances: male X3 appears to travel farther.*
10. Why might X2 and X3 spend time apart if they are mates? When do you think the Ospreys have their young? *The birds traveled to their migrations routes before they mated. They have their young when they nest together.*

IV. Assessment

In this lesson students will learn about the migration pattern of Osprey mates. Students should know how to plot locations on a map using latitude and longitude data and extract meaningful information and understanding from data tables. Referring to the data, students should make inferences about why the Osprey mates migrate to separate locations. The discussion/assessment questions listed above may be used to measure student understanding of Osprey migrations.

Learning Extensions for Authentic Assessment

1. In previous lessons of this unit, the concept of photoperiod was introduced as a means for animals to know when to begin their migrations. Students could explore this concept by going to the web site:

http://riemann.usno.navy.mil/AA/data/docs/RS_OneDay.html

Enter the dates for when Osprey X2 and X3 begin their migrations either north or south, and determine the photoperiod for each day. Pick other dates during the migration, and compare the photoperiod in the middle of the journey to the photoperiod(s) on either end of the journey.

2. **Bonus Questions!** Some students may wish to further study the migratory paths of these two osprey mates. The following questions may be used to guide their investigation.

a) How many miles did each of the birds have to fly to get back home from Mexico to Oregon? Check out a map with a scale! Or, go to one of the following websites and enter the latitude and longitude for each location to determine the *exact* distance between nests:

<http://www.indo.com/distance/> or <http://www.nau.edu/~cvm/latlongdist.html>

b) Once you know how many miles it was, can you determine roughly how many miles X2 and X3 had to fly each day in order to make it back home in the amount of time they took? Did X2 and X3 fly faster on the way *to* Mexico, or the return back home to Oregon?