



Lesson 13: North Atlantic right whale migration

Objective: Students will learn about the migration path of North Atlantic right whales and how researchers are studying the movement of these whales.

You will need:

- Ability to project PowerPoint presentation
- Copy of PowerPoint presentation, “*Right whale migration.*”
- Internet access (to access sound clips used in PowerPoint presentation)
- Worksheets (page 13-5; 1 per student)
- Optional: copies of Incredible Journey worksheet for each student (*Whales: Activities Based on Research from the Center for Coastal Studies* pg. 38)

Sunshine State Standards: SC.4.E.6.5; SC.4.P.12.2

Vocabulary: migration, sedative, hormones, calves, satellite tag, acoustic buoy, juvenile

Strategy:

1. Use the script below in conjunction with the PowerPoint presentation to teach students about North Atlantic right whale migration.

Slide 1. Today we are going to learn about North Atlantic right whale migration.

Slide 2. What does “migration” mean? Many animals spend part of the year in one location, but then move to another place for part of the year—often to look for food, or to breed. This movement is called migration. Can anyone name an animal that migrates? [*Answers include many insects, especially monarch butterflies, many birds, fish and whales*] Why do you think right whales migrate? [*Write the students’ suggestions on the board. If students don’t have any ideas, prompt them to think about what whales might need in order to survive, and how that might affect where the whales go. Ideas could be to follow food, to look for warmer or colder water, to look for mates etc. Some students might know that right whales come to the Georgia/Florida area in the winter to have their babies.*]

Slide 3. This map shows the western Atlantic Ocean and the east coast of North America. [*You may want to point out your location on the map*]. In the spring—late February through April—most of the North Atlantic right whales can be found off the coast of New England, especially in the area of Cape Cod Bay, Massachusetts [*As you mention each one, indicate the areas on the map*]. By May, most of the whales gather in an area just southeast of Cape Cod, where there are large patches of copepods, the plankton that right whales like to eat. In summer and early fall, many of the right whales move into the Bay of Fundy, or swim to waters off Nova Scotia where they feed. In the winter, pregnant female whales, accompanied by some juvenile whales and a few other adult whales, migrate about 1,400 miles south to the warmer waters off Georgia and northern Florida. The females will give birth to their babies, called calves, between about



- December and March. The whales do not feed much in this region because there is not a lot of plankton there for them to eat.
- Slide 4. Why do you think the pregnant whales come to Florida to have their calves? *[As a hint, ask them what is different about Florida compared to Massachusetts in the winter. e.g. the water is warmer; baby whales may be less stressed if they are born in warmer water. On the opposite side, there is less food for the moms, so they need to feed really well before they head south as they will be nursing their calf for a couple of months without being able to eat very much. Studies have shown that pregnant female right whales have thicker blubber than non-pregnant whales; that blubber apparently provides the nutrients needed for milk production.]*
- Slide 5. Where the rest of the adult whales go in the winter is a bit of a mystery, but they probably are going somewhere where there is lots of food. Recently, researchers have discovered that some of the whales may stay in the Gulf of Maine through the winter months. Also, there may be another calving area somewhere. It is difficult to learn where the other whales are because it is a very large ocean, and whales can only be spotted from the air when they are near the surface of the water, so it would not be realistic to try and make survey flights covering the entire North Atlantic Ocean year-round. Scientists believe that right whales should mate in the winter, as we think that their pregnancies last for about 13 months. There should be mating areas somewhere...presumably that is where some of the whales go in the winter. Scientists are using whale poop to learn more about this—they can measure compounds called hormones in the poop samples and can tell if the whale is a male or female, and also if it is a female that is ready to become pregnant. How do they find the whale poop? They are using specially trained dogs that can smell the poop and signal the scientists where to look!
- Slide 6. By late March, the whales that traveled to southern waters are migrating back north to the feeding grounds near Cape Cod.
- Slide 7. We know quite a bit about the whales that come to the southeastern U.S. coast because various agencies and groups make surveys to locate and identify the individual whales. Here you can see pictures of some of the different types of airplanes that are used to look for the whales.
- Slide 8. Observers in the airplanes and onshore use binoculars to locate right whales, then try to get good photographs of the whales so they can be identified.
- Slide 9. Scientists are using technology to try and learn more about right whale migrations. Satellite tags are attached to the back of a whale using suction cups. When the whale comes to the surface to breathe, and the tag sticks out of the water, it sends a signal into space where the signal is picked up by a satellite. The satellite can tell where the signal came from, and can transmit that information to a computer down on Earth. This allows scientists to plot the whale's location on a map.
- Slide 10. This map shows the path of a right whale that was tracked off the coast of Florida for about a week in January, 2011. The whale had been tangled up in rope. Scientists were able to remove the rope, but they had to use sedatives on the whale. Sedatives are medicines that make the whale calm so it doesn't swim away from the people who are



- trying to help it. The researchers attached a small satellite tag to the whale's skin so they could monitor the whale and make sure it didn't have any side effects from the sedatives. These tags do not stay attached to the right whales for more than a few days.
- Slide 11. Acoustic buoys—basically underwater microphones that record noises in the ocean—have been used in areas around Cape Cod to study whale movement. The devices record whale calls along with the date and time that the whale made the sounds. The data can be collected and analyzed by scientists to help them learn how the whales are moving around. The yellow ball-like device in the middle of this picture is an acoustic buoy. The researchers are getting ready to set it in place on the sea floor.
- Slide 12. So what is it that the researchers are listening for? On this website [*click on the link to navigate to the site*], we can hear some of the different types of calls that right whales make. [*one at a time, click on the wavelength icons to the left of the right whale photograph. Make sure that your volume is turned up! A description of each sound will appear to the right of the screen.*]
- Slide 13. Let's review what we know about North Atlantic right whale migration.
- Where are most of the North Atlantic right whales found in the spring, summer and fall? [*In waters from Cape Cod, MA to Nova Scotia, Canada—the yellow area on the map.*]
 - Why are they here? [*There is a lot of plankton here for the whales to eat.*]
 - Where do pregnant female North Atlantic right whales migrate to in the winter? [*To waters off southern Georgia and northeastern Florida—shown in orange.*]
 - Why? [*To have their calves.*]
 - How long do the moms and calves stay in the warm water? [*They will be there from about December through March or early April.*]
 - Where do the other whales go in the winter? [*Some juvenile whales and adult females will also spend part of the winter in the warmer southern waters. We still do not know where all of the other right whales go in the winter, but new research suggests that some of them may stay in their spring and summer feeding area year-round.*]

2. Give students copies of right whale migration worksheet to complete.

3. Optional activity: Whale migration activity/Incredible Journey worksheet from Scholastic's *Whales: Activities Based on Research from the Center for Coastal Studies* pg. 37-38.



Additional resources (for teachers):

About where North Atlantic right whales are in the winter:

<http://www.workingwaterfront.com/columns/Right-whales-spending-winter-in-the-Gulf-of-Maine/14272/>

<http://www.ens-newswire.com/ens/dec2008/2008-12-31-094.html>

http://www.boston.com/news/science/articles/2011/02/07/some_rare_right_whales_prefer_maine_in_winter/

About acoustic buoys:

www.nefsc.noaa.gov/press_release/2006/nr0601.htm

<http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/19961/MellingerEtAl-RightWhalesRediscovered.pdf?sequence=4>

<http://onlinelibrary.wiley.com/doi/10.1111/j.1748-7692.2010.00376.x/abstract?systemMessage=Wiley+Online+Library+will+be+disrupted+17+March+from+10-14+GMT+%2806-10+EDT%29+for+essential+maintenance&userIsAuthenticated=false&deniedAccessCustomisedMessage=>



Student name: _____

North Atlantic right whale migration worksheet

Read the paragraph and answer the questions below.

Right whale # 1408 was spotted on December 10, 2007 off the coast of Georgia. The same whale was observed several times in January and February 2008 off the coast of northern Florida and Georgia. It was spotted off Georgia on March 1, 2008, then was next seen in May in the Great South Channel (southeast of Cape Cod, Massachusetts).

1. Do you think whale # 1408 is a male or a female? What evidence in the paragraph supports your guess?

2. Whale # 1611 was spotted on March 2 in Florida and then again on April 30 in the Gulf of Maine. The whale swam about 1,400 miles.

a. How many days did it take the whale to swim 1,400 miles? _____

b. How many weeks is this? (your answer to part a \div 7)

c. Assuming the whale swam constantly without stopping, how many miles did it swim every week? ($1400 \div$ your answer to part b)

d. How many miles did the whale swim each day? (answer to part c \div 7)



ANSWER KEY

North Atlantic right whale migration worksheet

Read the paragraph and answer the questions below.

Right whale # 1408 was spotted on December 10, 2007 off the coast of Georgia. The same whale was observed several times in January and February 2008 off the coast of northern Florida and Georgia. It was spotted off Georgia on March 1, 2008, then was next seen in May in the Great South Channel (southeast of Cape Cod, Massachusetts).

1. Do you think whale # 1408 is a male or a female? What evidence in the paragraph supports your guess?

Female—she spent January to March off Florida and Georgia where she probably had a calf.

2. Whale # 1611 was spotted on March 2 in Florida and then again on April 30 in the Gulf of Maine. The distance between the two locations is about 1,400 miles.

a. How many days did it take the whale to swim 1,400 miles? 59 days

b. How many weeks is this? (your answer to part a \div 7)

$59 \div 7 = 8$ (remainder 3)

c. Assuming the whale swam constantly without stopping, how many miles did it swim every week? ($1400 \div$ your answer to part b)

$1400 \div 8 = 175$ miles per week

d. How many miles did the whale swim each day? (answer to part c \div 7)

$175 \div 7 = 25$ miles per day