

# Cetaceans 4<sup>th</sup> Grade Curriculum—Lesson 14: How Do Right Whales Communicate?<sup>1</sup>

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## Description

Students will learn how baleen whales use sound to communicate, and how human-created noise in the ocean may affect their ability to do so. Students will conduct an activity to simulate whale communication and interference by human noises.

## Objectives

By the conclusion of the activity, students will:

- Be able to explain how whales communicate with each other
- Be able to explain how noise in the ocean may make it difficult for whales to hear each other
- Be able to explain how scientists use underwater microphones to locate North Atlantic right whales in Massachusetts Bay

## What You Will Need

- Computer with Internet connection and speakers
- Projector or interactive whiteboard
- Music CD or other source of music

## Standards

### Sunshine State Standards

#### SCIENCE

- **SC.4.L.17.4** Recognize ways plants and animals, including humans, can impact the environment.

## Procedure

1. Before class starts, open the websites and audio/video clips listed in steps 7, 8, 10, and 12 below. Make sure your computer's sound is turned up.
2. Start by asking students how they communicate with each other and with their family and friends. [*Answers might include texting, talking, writing, drawing, making faces, etc.*]
3. Have students imagine that they are right whales, living underwater in the huge North Atlantic Ocean.
4. Ask the students how they think right whales communicate with each other. [*Sound. If students have completed Lesson 7, they should already be familiar with the fact that sound waves can travel through water.*]
5. Explain that you will be playing a game to see how well the students can listen. Give each student a piece of paper and pencil. Inform the class that they will not be graded on how many answers they get right or wrong, but how well they participate in the activity. Explain

1. This document is VM239, one of a *Cetaceans 4<sup>th</sup> Grade Curriculum* series of the Veterinary Medicine—Large Animal Clinical Sciences Department, UF/IFAS Extension. Original publication date June 2019. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

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- that everyone will be told to close their eyes and that everyone will need to be very quiet. You will walk around the room and touch one student on the shoulder. That student will say (in their normal voice) the words, “I am a right whale.” [*Write these words on the board as you explain this step.*] Say that the student can read the words off the board if they need to. When you say, “OK,” all students will open their eyes and write the name of the student who they think spoke the words on a sheet of paper. You will repeat this four or five times, keeping track of which student spoke each time. Once you have selected several students in different parts of the room, review the correct answers with the class. How did they do? Ask the students how they knew who was speaking. [*They should have recognized the person’s voice.*]
6. Explain that whales and dolphins have different voices, but that they also use different types of calls to communicate in different ways.
  7. Explain that you will be playing some right whale sounds. [*If you have done Lesson 13 with the students, they will have heard these sounds already.*] The students will need to be quiet because some of the sounds are difficult to hear. Make sure your speaker volume is turned up. Go to <https://dosits.org/galleries/audio-gallery/marine-mammals/baleen-whales/north-atlantic-right-whale/> and click on the different right whale calls. You may need to play them more than once for the students to hear them.
  8. Go to <http://www.voicesinthesea.org> and select “Species,” “Baleen Whales,” then “Blue Whale.” Move your mouse over to “Blue Whale Videos” in the upper right portion of the screen, and three options will appear. Click on the video called “The Voice of the Blue Whale.” [*This video clip is about a minute long.*]
  9. Ask the students what obstacles whales may face while communicating by sound in the ocean. If students cannot come up with any ideas, prompt them by asking if whales are the only things that make noise in the ocean. [*The answer is “no”—there are many other natural sources of noise in the ocean, from fish to shrimp to underwater volcanoes, but there are also many human-made noises in the ocean.*] Hearing whale calls over all of the other sounds in the ocean poses a great challenge.
  10. Explain to the students that they are going to listen to a recording made underwater in Massachusetts Bay, which is the area where right whales feed in the spring and summer. Go to <http://www.listenforwhales.org/page.aspx?pid=443> and click on “What Do We Sound Like to a Whale?” [*You may want to have students close their eyes while they listen.*]
  11. Remind the students how short and relatively quiet the right whale calls were. Ask the students if they think they could hear a right whale with all the ship noise going on.
  12. Explain that you are going to repeat the activity with some added ship noise. Tell everyone to close their eyes. You will start an audio clip of ship noise (e.g., <https://dosits.org/galleries/audio-gallery/anthropogenic-sounds/ship/>). You will quickly walk around the room and touch one student on the shoulder. That student will say (in their normal voice), “I am a right whale.” When the ship noise stops, all students will open their eyes and write the name of the student who they think spoke the words on a sheet of paper. You will repeat this four or five times, remembering which student spoke each time. Once you have selected several students in different parts of the room, review the correct answers with the class.
  13. Ask the students what happened. Was it more difficult for them to hear the student who was speaking? Ask the students if they think that ship noise might make it harder for whales to communicate with each other. [*Yes!*]
  14. Explain that researchers use underwater microphones to try to locate right whales in Massachusetts Bay. The [www.listenforwhales.org](http://www.listenforwhales.org) website has a map showing where these microphones are and whether or not they have detected a right whale call in the past 24 hours. Explain that the class is going to do an activity to simulate tracking whales in the ocean using whale sounds.
  15. Summarize the day’s lesson. Ask the students how whales communicate with each other [by sound] and what types of human activities might interfere with whales’ abilities to hear each other [*ships, airplanes, explosions, drilling, etc.*]. Why might this be bad for whales? [*In other words, if whales cannot communicate with each other, what might happen? Mothers and calves may become separated or lost, whales won’t be able to warn each other about dangers, whales won’t be able to tell each other where good food is, whales won’t be able to find each other to mate, etc.*]

## Optional Activities

1. If several computers are available, individual students or small groups can complete this activity. If a projector is available, the class can do the activity as a group. Go to [www.voicesinthesea.org](http://www.voicesinthesea.org) and click on “Games,” then “Call Matching.” There are other great things to do on this website as well.
2. This requires students to have access to computers with sound. Internal speakers on a laptop are sufficient. Headphones are ideal, but not required. Have students go to <http://www-g.eng.cam.ac.uk/mmg/teaching/peterstidwill/interact/resources/oceanodyssey.htm>. This is a great online game for the students to play. It teaches them about frequency, pitch, and volume. *Allow the students at least 30 minutes to complete.* Once the students have successfully freed the princess or mermaid, they are done. The website gives an option to continue. If students do continue, they will learn more about sound. This may take more time than is available.
3. A printable student worksheet on sound and transmission of sound through different materials can be found at <http://www.gscdn.org/library/cms/11/14411.pdf>.

## Reference

The activity above is modified from *Pod Squad* ([http://cetus.ucsd.edu/voicesinthesea\\_org/docs/education/PDFs/lesson4.pdf](http://cetus.ucsd.edu/voicesinthesea_org/docs/education/PDFs/lesson4.pdf)).