

Mystic Seaport for Educators
Science on the 38th Voyage of the *Charles W. Morgan*
Lesson 2 of 6: Eavesdropping on Echolocation
Teacher Introduction

MSE Lesson 2: Eavesdropping on Echolocation

Grade Level: 5-8

Time Frame: 45 minutes

NGSS Science Standards:

1. MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
2. MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
3. MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Learning Objectives:

- Students possess a basic understanding of how sound can be used to communicate in waves underwater, and why this is a more effective way of communication in this environment
- Students understand the different types of information that sound and echolocation can provide in marine mammals
- Students are able to apply this understanding to other sources of noise underwater, and can predict the effects of anthropogenic noise on marine mammals.
- Students can project their understanding of acoustic pollution to construct a future conservation scenario that minimizes human impact on the environment

Materials/Resources:

- Computer (with speakers, for audio and visual recording)
- Links to audio clips and recordings
- Worksheet

Instructional Strategies:

- Part 1 (10 minutes): To begin the lesson, ensure that each student has a worksheet. Ask them to read the introductory reading material, either aloud or to themselves.
- Part 2 (10 minutes): For question 1 on the worksheet, first open the provided links to the whale audio clips (<http://www.listenforwhales.org/page.aspx?pid=442>). Choosing two or more, play each audio recording with no visual clues. Ask students to first describe the sound and then try to guess its source. After students have guessed out loud, reveal the source of the sound. Repeat this exercise using shipping noise. (<http://www.listenforwhales.org/page.aspx?pid=443>) as the final source of sound on question 1.
- Part 3 (25 minutes): Once question 1 is complete, have students finish the questions on the worksheet, either in groups or individually.