Lesson 1.2
Exploring Waves
Lesson Overview

Students begin investigating the phenomenon of dolphins sending signals underwater. Students learn that sound travels as a wave. To understand how the dolphins are able to communicate, students set out to learn about what waves are. Students make waves using ropes and spring toys in order to observe their motion and discover that they move in patterns. The purpose of this lesson is to allow students to begin to observe waves and their patterns of motion.

**Anchor Phenomenon:** Dolphins in Blue Bay National Park communicate with one another underwater.

**Investigative Phenomenon:** Dolphin sounds

**Students learn:**

- Scientists gather information by making observations.
- Making and recording observations makes it easier to look for patterns.
- Scientists use scientific language to talk about their work.
- Something we observe to be similar over and over again is called a pattern.
- Sound travels as a wave.
- A pattern of motion that travels away from a source is called a wave.
Sound Is a Wave

Students are introduced to the reference book and read about how sound travels.

Instructional Guide

1. Review students’ role and the phenomenon they are investigating. Have students recall the previous lesson’s activities, and then ask a student to remind the class of the task they have been given. [Mother dolphins and their calves always seem to find one another when they are separated. The dolphins must be using sound to communicate across distances. How are the dolphins communicating with sound?]

2. Revisit the Chapter 1 Question. How does a mother dolphin communicate with her calf across a distance? Remind students that over the next few lessons, they will work to answer this question.

3. Introduce the reference book. Explain that one important thing scientists do before they begin an investigation is read information that other scientists have gathered about the topic they will be studying.

4. Show the cover of the book *Patterns in Communication*. Let students know that this is a reference book, a special kind of book that is not read cover to cover. Explain that reference books are useful places to look for information about a particular topic.

5. Distribute a copy of the book to each pair of students.

6. Have students turn to page 4 of *Patterns in Communication*. Let students know that they will have more chances to find useful information in this book later on, but today, they’ll just read a few pages from the introduction, pages 4–6. Give pairs a few minutes to read pages 4–6.

7. Have students share their ideas. Regain the class’s attention and ask volunteers to share something interesting they read.

8. Point out that sound is a wave. Read aloud the sentence on page 6, “When a dolphin makes a sound, that sound travels as sound waves.”
We have just read that sound is a kind of wave and that a wave carries information. We should figure out how waves travel to understand how the sound from the mother dolphin is getting to her calf.

9. Collect all copies of *Patterns in Communication*.

10. Post the Unit Question on the classroom wall. Have a student read aloud the Unit Question: *How do waves transfer information from one place to another?* Inform students that by the end of the unit they will be able to answer this question.

Teacher Support

Background

**About the Book: Patterns in Communication**

*Patterns in Communication* is the reference book for this unit. It provides students a place to find information about how and why various animals use patterns to communicate. The introduction explains how most of these patterns travel in waves and explains some features that all waves have in common. The book is divided into four sections focusing on different types of organisms: marine mammals, birds, insects, and humans. Each section offers many accessible examples of auditory and visual communication, such as bee dances and dolphin whistles. Each example includes an explanation of the mechanisms involved in the communication, the patterns that the organisms use, and the reasons for the communication. In addition to reinforcing key unit content, this reference book supports students’ firsthand investigations of waves and serves as a resource from which students can gather secondhand evidence about features of sound waves.

**Background**

**Literacy Note: About Reference Books**

Reference books provide in-depth information about specific topics and are typically read for particular purposes. For this reason, students do not read every section in reference books, nor do they read reference books from beginning to end. Rather, they search for the information they need and then read the relevant sections carefully. In this lesson, students read the first few pages of the introduction. Students will return to the book multiple times throughout the unit to search for information. Reading reference materials in this way is authentic to how scientists use reference materials, and it encourages students to read complex text both purposefully and carefully.

**Rationale**

**Pedagogical Goals: Informational Text**

A major goal of this curriculum is to deepen students’ awareness of and experience with the genres of science writing they are likely to encounter in school and in their lives outside of school. This curriculum program is designed to address the Common Core State Standards for English Language Arts (CCSS-ELA) related to reading and writing informational text, with a specific focus on science text. Learning effective strategies and approaches for comprehension of informational text is extremely important for success in school, yet reading and writing these texts can be challenging for many students. The student books and related investigations in this curriculum provide explicit, supportive instruction around how to tackle informational text.
Rationale

Pedagogical Goals: Unit Question
Posting questions on the wall throughout the unit is a valuable way to focus students’ attention on the most important content of the lessons. The Unit Question, which is introduced in this lesson, frames what students will investigate throughout the entire unit. It acts as a reminder to students of their goals for learning and helps them relate specific experiences to a broader idea. It can be very rewarding for students to see their own progress in being able to answer the Unit Question more and more completely as they progress through the unit.
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