

## Observation Sequences for Grades 4-12

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### **Observation Sequence #1**

#### *Whale Identification*

Whales are relatively difficult animals to study in the wild. Many species live in remote areas, spend much of their lives underwater, and often show little of themselves when they surface to breathe. Many cetacean research projects rely on the ability of scientists to identify different species of whales. It is possible to identify different species of whales by noting both physical and behavioral characteristics of whales.

In this observation sequence, the students will explore one method by which marine mammalogists can identify whales in the field. They will observe video of different whales and draw their observations on the data sheet. Then they will use either the Simplified Dichotomous Key or the Field Guide to identify each whale.

### **Observation Sequence #2**

#### *Behaviors of Whales*

Behavioral studies have helped to influence lawmakers in establishing Marine Ecological Reserves and in developing other policies relating to the protection of marine mammals. In the 1970's, studies of resident orca populations in the U.S. and Canada led to legislation restricting their capture. Currently, studies of gray whales are being used to determine what effects, if any, a new salt mine would have on gray whales in the San Ignacio lagoon.

In this observation sequence, the students will observe video clips of different whales. They will note their observations on their data sheets. They will use behavior pictures and ID cards to analyze their data and write hypotheses about the behavior they observed. Inferences about behavior will be discussed as a class.

### **Observation Sequence #3**

#### *Whale Sound*

Whales are anything but silent giants. Using underwater microphones, called hydrophones, Marine biologists have recorded whole symphonies of whale sounds, squeaks to chirps, gurgles, growls, moans, and cries. Although the meanings of these noises are not currently understood, scientist can distinguish one type of whale's voice from another and have been able to find elaborate sequences that constitute whale songs. Biologist studying whale songs use an oscilloscope. Oscilloscopes translate sound waves into electrical impulses that can be viewed on a florescent screen as a series of lines. Pictures of whale songs created with an oscilloscope help researchers to see as well as hear these sounds and tell one song apart from another.

In this observation sequence, the students will listen to the voices of three whales and create sound maps that will help them to recall the oscillations they hear. Students will be challenged to identify a 4<sup>th</sup> mystery voice

### **Sample Schedule**

12:00	Connect: Welcome to the Ocean Institute
12:10	Introduction to Whales
12:15	Studying Whales in the Wild <i>Observation Sequence #1: Identifying Species of Whales</i>
12:25	Studying Whales in the Wild <i>Observation Sequence #2: Identifying Whale Behavior</i>
12:40	Studying Whales in the Wild <i>Observation Sequence #3: Whale Sounds</i>
12:45	Questions and Answers
12:50	Disconnect

# Observation Sequence #1: Whale Identification

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Directions: Circle the blow, dorsal fin, fluke, and head that match the whale you see. Use the field guide to identify your whale and write the species name at the bottom of the page.

## Blows

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## Dorsal Fins

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## Flukes

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## Heads

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Name of Whale Species \_\_\_\_\_

## Observation Sequence #2: Behaviors of Whales

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### Observation Site Data

Instructions: Record the conditions of the observation site.

<b>Date</b>		<b>Vessel Name</b>	RV Sea Explorer
<b>Location</b>	Southern Pacific Ocean		
<b>Ocean Conditions</b>			
<b>Weather Conditions</b>			

### Whale Sighting Data

Instructions: Record your observations of the whales you see.

<b>Time</b>		
<b>Number of Whales</b>		
<b>Behaviors</b>		
<b>Description of Whales</b>		
<b>Notes</b>		
<b>Name of Whale</b>		

## Observation Sequence #3: Whale Sound

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1. Look at the example of a sound map
2. Listen carefully to the sounds made by three different types of whales.
3. Create your own sound map of the sounds that you hear.
4. Listen to and make a sound map of the mystery whale voice.
5. Compare the mystery voice to those that you know. Can you identify the voice?

### Sound Map Symbols



Humpback Whale

Right Whale

Blue Whale

Mystery Whale