

**Do You Hear What I Hear?**  
or  
**Do Ocean Animals Produce and Use Sound Like We Do?**

**Student Activity Sheet**

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

Sound is produced when an object vibrates; as a result, the vibration sends out waves of energy that are changed by the medium they pass through: gas, water, or solid.

**Materials:**

Pencil

Student Activity Sheet

Student Listening Sheet

**Discovery of Sound in the Sea** Audio Gallery

(<http://omp.gso.uri.edu/dosits/gallery/intro.htm>)

**Procedure:**

1. Listen carefully as your teacher makes different words. Write your guesses and answer the questions on your recording page.
2. Go to the **Discovery of Sound in the Sea** web site. Listen to the following ocean animal sounds:
  - a. beluga whale
  - b. bottlenose dolphin
  - c. snapping shrimp
  - d. killer whale
  - e. California sea lion
3. Listen a second time to the same ocean animals. As you listen to each, try to imitate each sound. Answer the questions on your recording page and try to imitate each animal sound.
4. Create a Venn diagram. Your three areas will be labeled: Human Sounds, Ocean Animal Sounds, Human and Ocean Animal Sounds.
5. Write a short paragraph explaining the differences you have found between human and ocean animal vocalizations and sounds.

## Student Listening Sheet

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

1. Listen as your teacher makes different words. Write the word that your teacher is making.

a. \_\_\_\_\_ b. \_\_\_\_\_  
c. \_\_\_\_\_ d. \_\_\_\_\_  
e. \_\_\_\_\_ f. \_\_\_\_\_

2. Listen again as your teacher makes different words and sounds. Write the word or sound your teacher is making.

a. \_\_\_\_\_ b. \_\_\_\_\_  
c. \_\_\_\_\_ d. \_\_\_\_\_  
e. \_\_\_\_\_ f. \_\_\_\_\_

3. Listen again as your teacher makes different words and sounds. Write the word or sound your teacher is making.

a. \_\_\_\_\_ b. \_\_\_\_\_  
c. \_\_\_\_\_ d. \_\_\_\_\_  
e. \_\_\_\_\_ f. \_\_\_\_\_

Which listening activity was the easiest to understand, first, second, or third? Why?

\_\_\_\_\_  
\_\_\_\_\_

Did anything help you guess what was said in the first set of sounds?

\_\_\_\_\_

Was any one of the listening activities more difficult? Why?

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4. Listen to ocean animal sounds

5. Listen again to the same ocean animals. As you listen to each, try to imitate each sound. Check off each as you do it.

- a. \_\_\_ beluga whale
- b. \_\_\_ bottlenose dolphin
- c. \_\_\_ snapping shrimp
- d. \_\_\_ killer whale
- e. \_\_\_ California sea lion

Was it easy or difficult to imitate the sounds? Why do you think so?

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Try to guess what the animals were trying to communicate.

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**Do You Hear What I Hear?**  
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**Teacher Strategy Section**

**Grade Level:** Elementary, Middle, High School

**Time Required:** 45 minutes to complete the lesson; additional time for the Venn diagram and written paragraph

**Standards Addressed:**

Science:

S4 Scientific Connections and Applications

- S4(a) The student produces evidence that demonstrates understanding of big ideas and unifying concepts
- S4(d) The student produces evidence that demonstrates understanding of science as a human endeavor

S5 Scientific Thinking

- S5(a) The students demonstrates scientific inquiry and problem solving by asking questions about natural phenomena, objects, and organisms
- S5(c) The students demonstrates scientific inquiry and problem solving by using evidence from reliable sources to construct explanations

S7 Scientific Communication

- S7(a) The students represents data and results in multiple ways, such as graphs and creative writing

Math:

M4 Statistics Probability

- M4(a) The students collects and organizes data to answer a question
- M4(b) The student displays data a graph
- M4(c) The student makes statements and draws conclusions based on simple data

M6 Math Skills and Tools

- M6(g) The student reads and creates data on simple circle graphs

RI English Language Arts Framework

- Standard 1: Students will communicate in a variety of ways and for a variety of purposes

Applied Learning

- A3a Students gather information to assist in completing project work
- A3b Students use information technology to assist in gathering information

## **Objectives:**

To have children understand that marine animals rely on sound.

Children will understand that humans use visual and auditory means to communicate but marine animals must rely primarily on sound for survival.

## **Background Information:**

Sound is a phenomenon that occurs as a result of objects vibrating. The vibration sends out waves of energy that alternately compress and decompress the medium they are traveling through (air, water, or solid). (For more information see "How are sound made" - <http://omp.gso.uri.edu/dosits/science/whatis/3.htm>). Sound and sound waves are described using two characteristics: pitch - how high or how low a sound is (based on the frequency, or number of vibrations in a second) and volume (intensity, based on the magnitude of the vibration back and forth). Sound is changed based upon the medium it passes through.

Sound is made in people as air passes by the vocal folds causing them to vibrate. As the waves pass through the oral cavity the sound is changed based on the shape of the cavity that it passes through. Our oral cavities basically act as a resonating chamber through which the sound waves are passing through. People are capable of producing a vast variety of different sounds because we are able to change the shape of our oral cavities.

Human language is made up of consonants and vowels sounds. Speech sounds are made when airflow is acted on by rapidly altering the muscles of the oral periphery creating our vowel and consonant sounds. Vowels are made by an unobstructed flow of air through the mouth. The vowel sounds differ based upon the relative position of the tongue in the oral cavity and shape of the lips. It is very difficult to determine (lip-read) vowels without sound because manner and placement of articulators is within the oral cavity. Consonants are made when the airflow is obstructed, modified, or interrupted by muscles and structures in the oral cavity. It is easier to read consonants because they are more visible. Still, both vowels and consonants are quite difficult to determine without the accompanying sound created by our vocal cords.

People communicate through verbal and non-verbal forms of communication. Over 90% of human communication is non-verbal. Marine animals cannot communicate as efficiently through movements. Not only are they limited by their anatomy but because the ocean is dark, visual communication would not be received.

Sound is important in the ocean. The sunlight does not penetrate very deeply. Vision is limited. So ocean animals must rely on other senses rather than sight. Marine mammals use sound for many purposes such as socialization, navigation, defense/aggression, and feeding. Sound is made in marine mammals in ways that are similar and different to

humans. Refer to the following sections of the *Discovery of Sound in the Sea* web site for more information:

- How do marine mammals produce sound?  
<http://omp.gso.uri.edu/dosits/animals/produce/1a.htm>
- How do marine mammals communicate using sound?  
<http://omp.gso.uri.edu/dosits/animals/use/1a.htm>
- How do marine invertebrates communicate using sound?  
<http://omp.gso.uri.edu/dosits/animals/use/1c.htm>
- How do marine mammals use sound when feeding?  
<http://omp.gso.uri.edu/dosits/animals/use/2.htm>
- How do marine mammals use sound to navigate?  
<http://omp.gso.uri.edu/dosits/animals/use/2.htm>

## INSTRUCTIONAL STRATEGIES

### Preparation:

1. Go to *Discovery of Sound in the Sea* web site. Become familiar with the audio gallery animal sounds (<http://omp.gso.uri.edu/dosits/gallery/intro.htm>).
2. If your school is networked, prepare a page that your students can go to with web addresses of the animal sounds. Students can simply click on the links to get to the sites/pages for the animal sounds.

### Assessing Prior Knowledge:

1. Have each student fill out individual K-W-L charts for ocean animal sounds. Later, when students fill out the L portion, use this for assessment.
2. Fill out a whole-class K-W-L chart
3. Begin the class with a group discussion and brainstorming activity.
  - How is sound produced?
  - How is sound produced in humans?
  - What kind of reasons do people have for making sound?

### Procedure:

#### A. Introduction - brainstorming questions for students

Refer to web sites listed under Background Information.

1. How is sound produced?
2. How is sound produced in humans?
3. What kinds of reasons do people have for making sounds?

#### B. Activity - See "How do marine animals communicate using sound?"

<http://omp.gso.uri.edu/dosits/animals/use/1.htm>

<http://omp.gso.uri.edu/dosits/animals/use/1a.htm>

Tip: Use the word “listen” for activity 1, 2, and 3. This will make the children use their ears then come to the realization that they are relying on another sense to interpret the sound. This will be how you link the importance of sound production in ocean animals.

Activity 1 involves auditory and visual cues. It will be easier for children to guess the answer.

Activity 2 involves use of auditory cues alone. The teacher should cover her mouth or stand behind a screen when talking. Again, this will target the importance of sound.

Activity 3 is a lip-reading activity. This will focus children on the importance of sound and using sound to communicate.

Tip: Don't give the students the answers to the items that used lip-reading. Ask children what they thought you were saying. Write the answers on the board. Have children draw similarities between some of the words they came up with. For example, 'mom' could be 'mom', 'pop', or 'bob' because the 'm, p, b' are all lip sounds.

### Discussion Questions

1. Why were there such varieties in our answers to the lip-reading activity?
2. Why is lip-reading difficult?
3. Is it easier to understand some sounds better than others?
4. Why is it easier to understand the first and second demonstration the teacher did?
5. How do you think this relates to ocean animals?
6. Do you think ocean animals make sound the same ways people do? Why?
7. Describe how you think ocean animals might make sound.
8. What kinds of reasons might an ocean animal have for producing sound?
9. How do people communicate?

Tip: When children listen to the ocean animal sound to imitate, be aware that the humpback whale sound is of a pectoral slap. It is not a vocalization.

### C. Discussion questions for wrap-up and reflection

1. Do ocean animals make sounds?
2. Do they make sound the same way people do? Describe how ocean animals make sound. Compare it to the way humans make sound.
3. Why do you believe ocean animals make sound? Are some of the reasons the same as for people? Do you think ocean animals make sound the same ways people do? Why?

Follow-up by reading Dolphin's First Day by Kathleen Weider Zoehfeld. This book comes with an audiotope of the story including real dolphin sounds.

D. Answer Sheet

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Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

Sound is produced when an object vibrates; as a result, the vibration sends out waves of energy that are changed by the medium they pass through: gas, water, or solid.

Procedure:

1. Listen as your teacher makes different words and sounds. Write the word or sound that your teacher is making.

a. \_\_\_\_\_ mom \_\_\_\_\_      b. \_\_\_\_\_ did \_\_\_\_\_

c. \_\_\_\_\_ animal \_\_\_\_\_      d. \_\_\_\_\_ child \_\_\_\_\_

2. Listen again as your teacher makes different words and sounds. Write the word or sound your teacher is making.

a. \_\_\_\_\_ hello \_\_\_\_\_      b. \_\_\_\_\_ come \_\_\_\_\_

c. \_\_\_\_\_ okay \_\_\_\_\_      d. okay (with finger and thumb)

e. \_\_\_\_\_ hi \_\_\_\_\_      f. \_\_\_\_\_ hi (with wave) \_\_\_\_\_

3. Listen again as your teacher makes different words and sounds. Write the word or sound your teacher is making.

a. \_\_\_\_\_ down \_\_\_\_\_      b. \_\_\_\_\_ cat \_\_\_\_\_

c. \_\_\_\_\_ ship \_\_\_\_\_      d. \_\_\_\_\_ hooray \_\_\_\_\_

Which listening activities were the easy to understand, first, second, or third? Why?  
The first time was the easiest because I could see and hear. The first and second times were easy because I could hear what the teacher was saying.

Did anything help you guess what was said in the second set of sounds? It was easier the second time when my teacher included a wave.



Was any one of the listening activities more difficult? Why? The last one was the most difficult because we had to rely on vision alone.

4. Was it easy or difficult to imitate the sounds? Why do you think so? It was difficult to imitate most of the sounds. Our mouths (oral cavities, vocal tracts, etc.) are much different structurally from the ocean animals.

Try to guess what the animals were trying to communicate. Answers will vary. The main thing ocean animals use sound for are socialization, danger, breeding, and feeding.

Discussion questions for wrap-up and reflection

- Do ocean animals make sounds?
- Do they make sound the same way people do?
- Describe how ocean animals make sound.
- Compare it to the way humans make sound.
- Why do you believe ocean animals make sound?
- Are some of the reasons the same as for people?
- Do you think ocean animals make sound the same ways people do? Why?

Follow-up by reading Dolphin's First Day by Kathleen Weider Zoehfeld. aloud.

**Assessment:**

1. Utilize the L portion of the individual K-W-L charts. Each child completes a K-W-L chart for ocean animal sounds
2. Each child creates a Venn Diagram
3. Each child picks an ocean animal and writes to describe the types of sound of their ocean animal makes and explains reasons the animal might have for using the sound (similar to Feature Sounds stories on ***Discovery of Sound in the Sea*** site: <http://omp.gso.uri.edu/dosits/teacher/teach1.htm>).
4. Write a compare/contrast paper comparing marine animal communication vs. human communication.

**Extension Ideas:**

- As children listen to the ocean animal have them write describing words for each animal sound. Words from the generated list can then be used in a language arts exercise (the paragraphs suggested or another of your choice).
- Have children write a Haiku using the describing words above. Haiku is a three line poem originating from Japan that describes a scene or object from nature. It has 17 syllables with a 5-7-5 pattern in each line.
- Write a compare/contrast commentary on human versus sea animal sounds.
- Provide an activity to extend the way humans vocalize and verbalize by changing the resonance in their oral cavity. For example divide students into groups. Have them experiment with making different sounds then have them

hypothesize why the sounds are changing. Repeat the activity only this time have them make a specific sound, like the “ah”. Then, they should freeze their mouths in that open position and try to make an ee sound. What happens? Research ocean animals to see if they are able to change the way their sound is produced. For example, the beluga whale is capable of a wide variety of sounds because the blubber in his melon head changes shape as sounds are produced.

### **Procedural Tips:**

Tip: Encourage children to get in the practice of answering questions with complete answers. Conversationally we often answer in phrases so we accept them in writing. Answering in complete sentences gives children language arts practice.

Tip: An easy way to help children generate complete sentences when answering is to use the “turn the question around” strategy. With this method, children are using part of the question in their answer.

Tip: Don't give the students the answers to the items that used lip-reading. Ask children what they thought you were saying. Write the answers on the board. Have children draw similarities between some of the words they came up with. For example, 'mom' could be 'mom', 'pop', or 'bob' because the 'm, p, b' are all lip sounds.

Tip: Use the word “listen” for activity 1 and 2 and 3. This will make the children use their ears then come to the realization that they are relying on another sense to interpret the sound. This will be how you link the importance of sound production in ocean animals.

### **Resources:**

#### 1. "Turn the Question Around" Strategy

Explain to children that they need to answer all questions in complete sentences. An easy way to help them is to use part of the question to start your answer. For example, if the question is:

Which listening activity was easy to understand?

First ask them to tell you what the question is asking? Most likely, they will say: “the listening strategy that is easy to understand” They then underline those words in the sentence.

Which listening activity was easy to understand?

Tell them those are the words that will start their answer:

“The listening activity that was easiest to understand was. . . “

2. The following marine animal sounds are included in the ***Discovery of Sound in the Sea*** Audio Gallery (<http://omp.gso.uri.edu/dosits/gallery/intro.htm>)
- beluga whale
  - bottlenose dolphin
  - snapping shrimp
  - killer whale
  - California Sea Lion

**Venn Diagram** - (see last page)

**Books:**

Dolphin's First Day by Kathleen Weidner Zoehfeld, Sound Prints, 1994

**References/Resources:**

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<http://oceanlink.island.net>  
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<http://www.seaworld.org/infobooks/Beluga/becommunication.html>  
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National Sciences Resources Center, 1997. Teacher Guide, Sound Kit, National Academy of Sciences

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This activity was developed by Lee Ann DiSalvia McWeeney, MS(CCC-SLP) during the *Discovery of Sound in the Sea* Teacher Institute. University of Rhode Island, Office of Marine Programs, 2002.

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**Do Ocean Animals Produce and Use Sound Like We Do?**

