

## **Waves, Energy, and Information:**

Investigating How Dolphins Communicate

**Grade 4 - Lessons 3.1, 3.2 and 3.3**

Accompanying Videos and Books can be found at:  
[tinyurl.com/SciLessons](https://tinyurl.com/SciLessons)

Other Amplify resources can be found at:  
[amplify.com/remoteteaching/Science/resources](https://amplify.com/remoteteaching/Science/resources)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Daily Written Reflection

Think of two sounds that are very different. Describe each of the sounds. How are they different?

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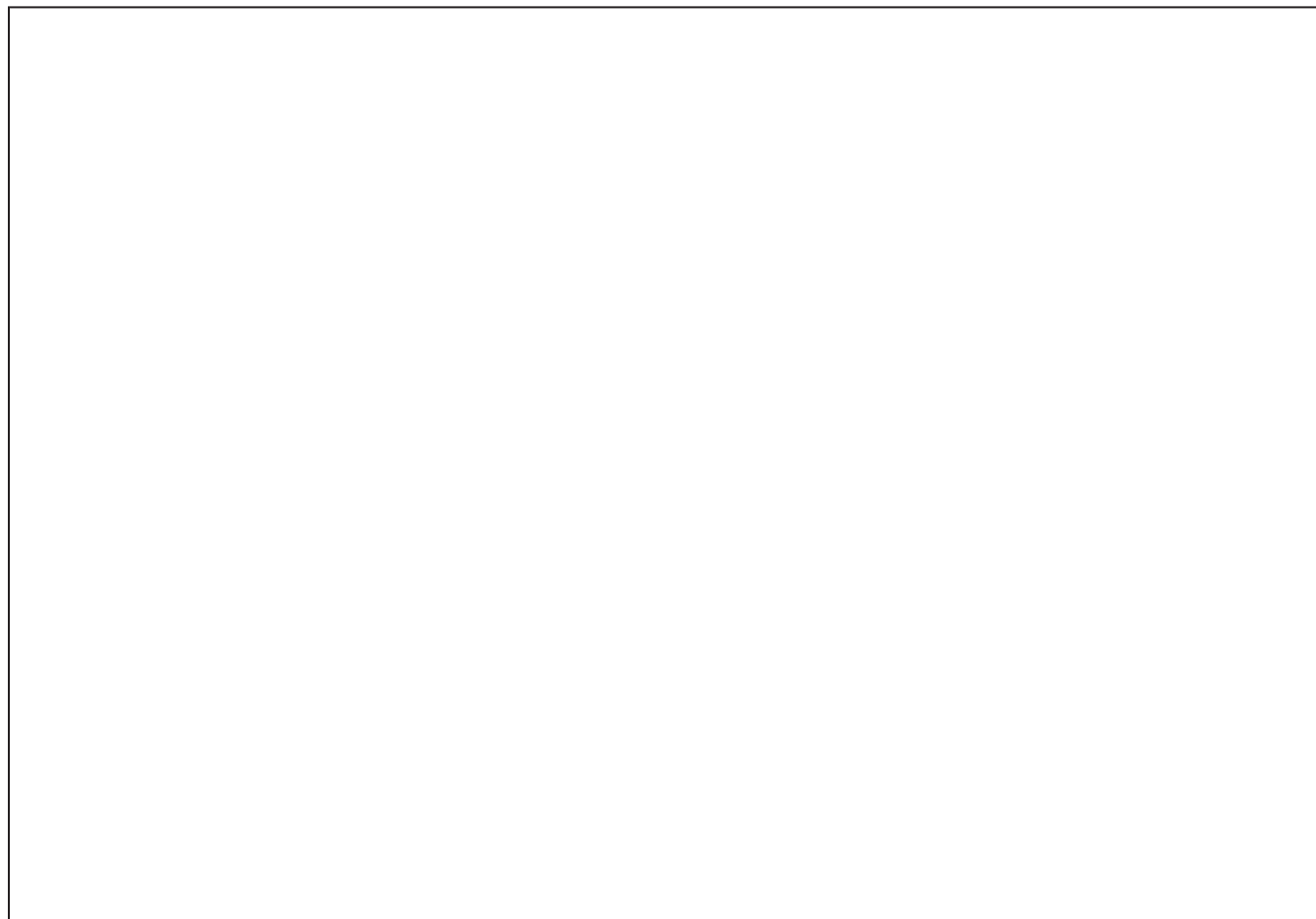
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Make a drawing if it helps you explain your thinking. Label your drawing, then take a photo of it and attach it in the box below.



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Investigating Amplitude

1. Open the Custom Sound mode of the Sound Waves Sim.
2. Press Play to play a sound, and while the sound is playing, use the Amplitude slider to change the sound.
3. Observe what happens as you change the sound. Use your eyes and ears to make your observations.
4. Use what you observed to answer the questions below.

The amplitude is \_\_\_\_\_ (larger/smaller) when the sound is louder.

The amplitude is \_\_\_\_\_ (larger/smaller) when the sound is quieter.

What happens to the waveform when you change the amplitude?

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Draw a waveform for a loud sound. Take a pic of your drawing & attach below.



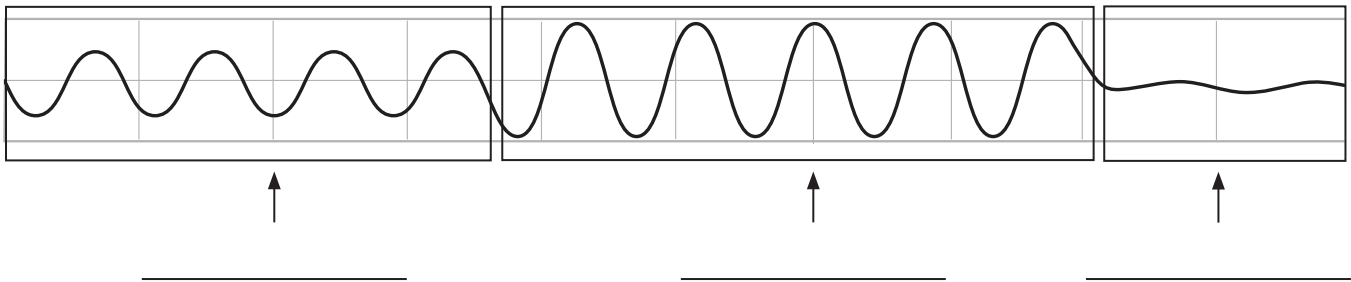
Draw a waveform for a quiet sound. Take a pic of your drawing & attach below.



## Analyzing Amplitude

1. Look at the Wave Printout below. Label the volume of the sound in each section of the waveform.
2. Open the Custom Sound mode of the Sound Waves Sim.
3. Press Play to play a sound, and as the sound is playing, use the Amplitude slider to try to make the Wave Printout match the one shown below. It may take a few tries!
4. Update your labels if needed.

### Wave Printout



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Daily Written Reflection

What happens to a sound when the amplitude of the sound wave changes?

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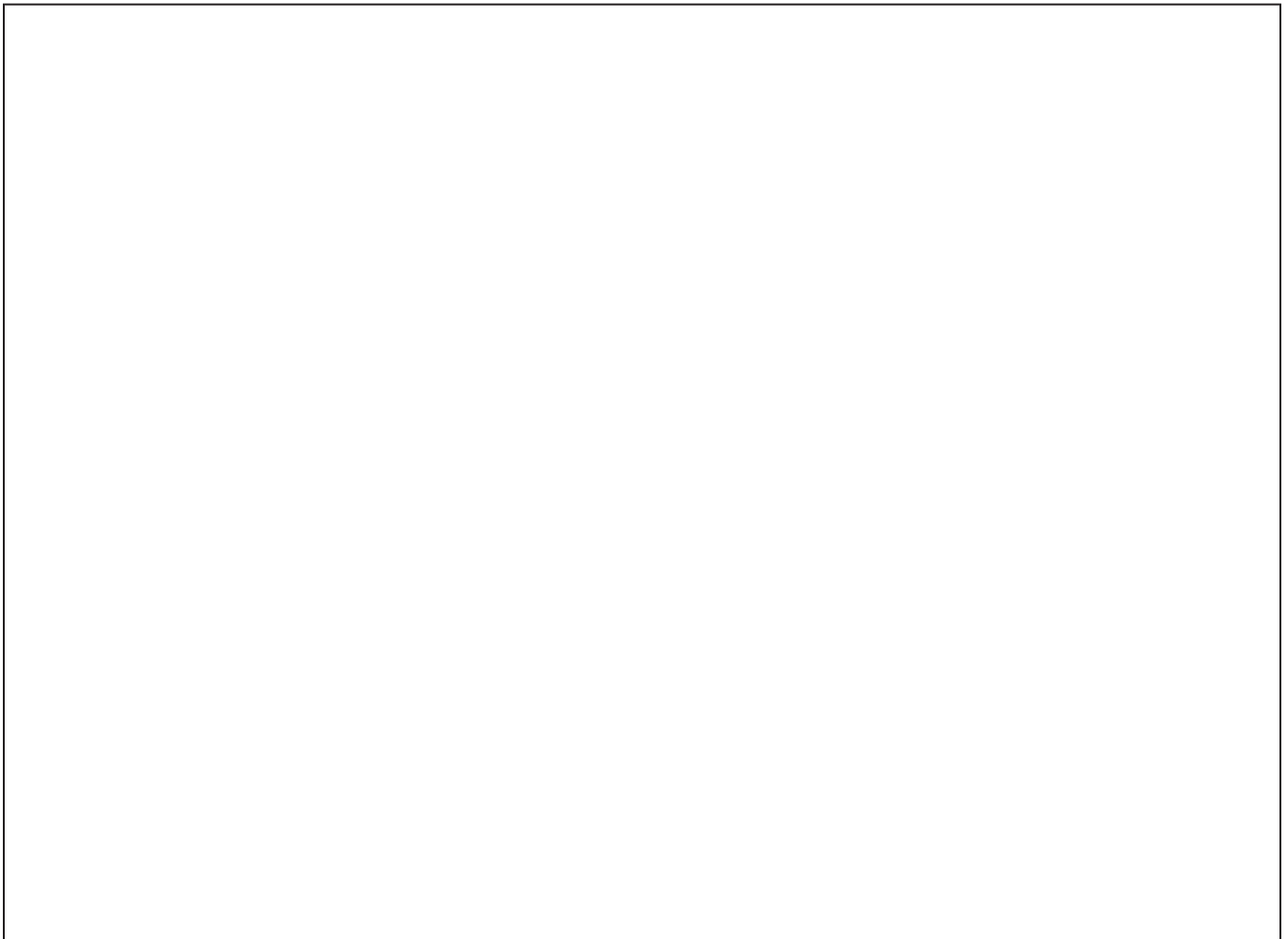
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Make a drawing if it helps you explain your thinking. Label your drawing, then take a photo of it and attach it in the box below





Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Investigating Wavelength

1. Open the Custom Sound mode of the Sound Waves Sim.
2. Press Play to play a sound, and while the sound is playing, use the Wavelength slider to change the sound.
3. Observe what happens as you change the sound. Use your eyes and ears to make your observations.
4. Use what you observed to answer the questions below.

How does the sound change?

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As the sound changes, what do you observe about the shape of the wave?

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As you play sounds in the Sim and change the wavelength, look and listen for patterns. What patterns do you observe?

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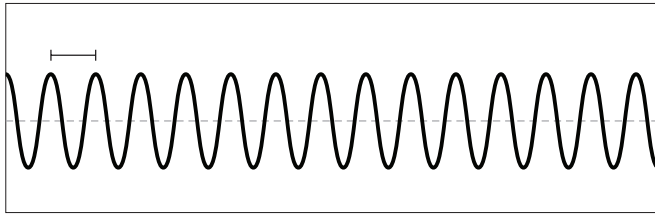
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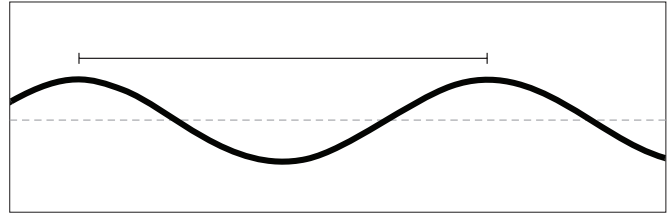
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### Daily Written Reflection

Below are waveforms for two sounds, Sound A and Sound B. Which of the two sounds has a higher pitch? How do you know?



Sound A



Sound B

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## Reading About Wavelength and Amplitude

1. Read the following sections of *Patterns in Communication* that contain information about both amplitude and wavelength:
  - Information That Travels as Waves (pages 6–7)
  - Treehopper Communication (pages 34–35)
2. As you read, don't forget to look carefully at the diagrams and images as well as the text.
3. After reading, answer the following questions.

How are wavelength and pitch related?

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How are amplitude and volume related?

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Reading About Wavelength and Amplitude (continued)

How do the sounds treehoppers make differ from one another?

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Optional: Use the index to find another section that has information about either amplitude or wavelength. Read that section and record one thing you learned.

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Think-Draw-Pair-Share: Drawing a Sound

1. Listen to the sound your teacher plays for you.
2. On a piece of paper, draw what you think the waveform for the sound looks like.
3. Label the amplitude in one part of the waveform.
4. Label the wavelength in one part of the waveform.
5. Use your drawing to discuss your ideas with your partner/family member.
6. Take a photo of your drawing and attach it in the box below.

