

### BLM 2: Student Exploration Sheets

Make 1 copy of the page for every 2 students. Cut to make 1 cutout per student who will visit each station.

Name \_\_\_\_\_

Check the station you are observing: balloon cup  water tank  light and motor

Describe what you observed. Include both a cause and an effect.

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Check the station you are observing: balloon cup  water tank  light and motor

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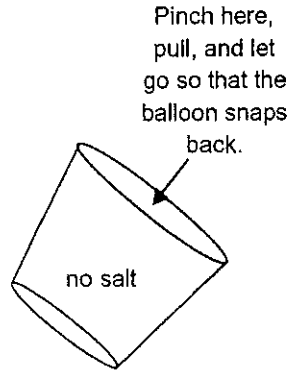
Name \_\_\_\_\_

Check the station you are observing: balloon cup  water tank  light and motor

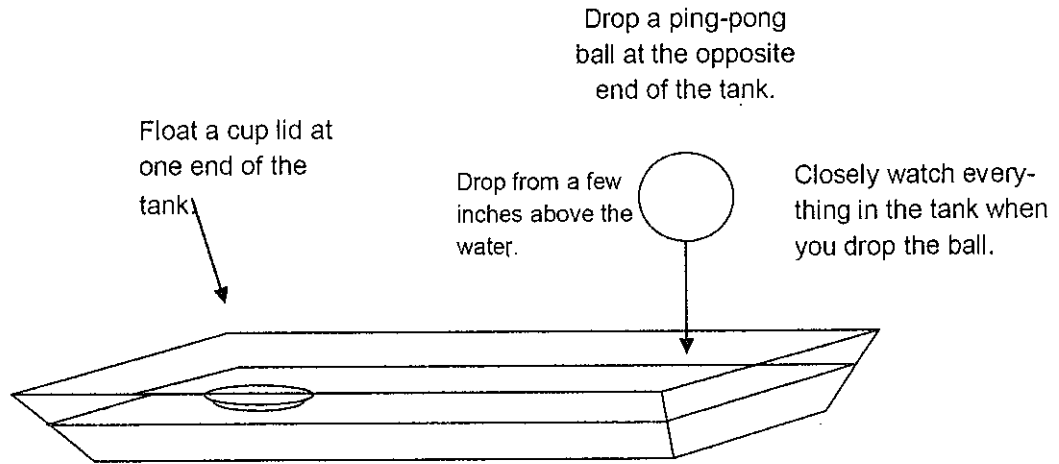
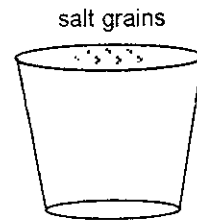
Describe what you observed. Include both a cause and an effect.

# BLM 1: Station Directions

Cut these out and place at the appropriate stations.

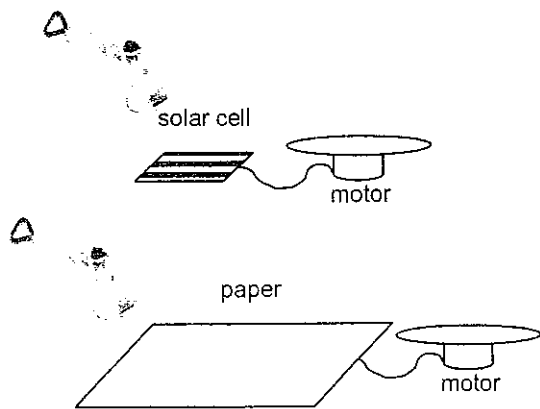


Lift the cup without salt a few inches above the table and hold it 8-10 inches from the cup that has salt on it. Pinch the center of the balloon on the lifted cup and stretch the balloon away from the cup. Let go with a snap. Watch the salt grains on the other cup.



Start with the clamp light off and the motor still. Turn the light on. Watch what happens when the light is turned on, and again when it is turned off.

With the clamp light off and the motor still, put a piece of paper over the solar cell and then turn on the light. Watch what happens. Then, with the light still on, remove the paper covering the solar cell. Observe what happens.



Scan Lesson 1. Read the lesson titles and bold words. Look at the pictures. Identify three facts you discovered about waves. Record your facts in your Science Journal.

## Main Idea

What are waves?


I found this on page \_\_\_\_\_.

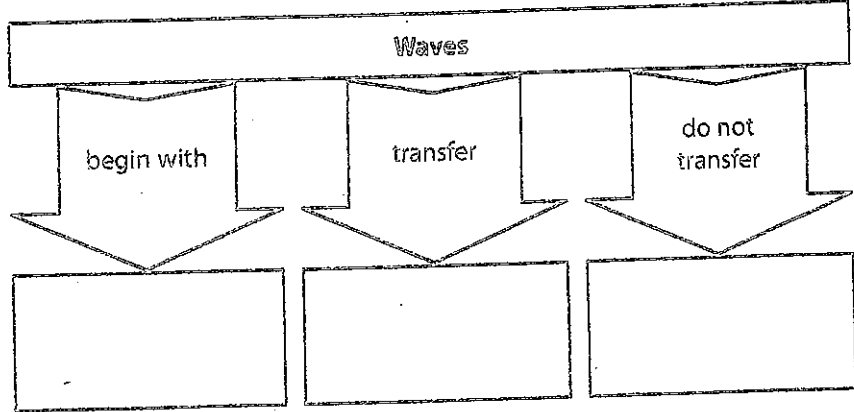
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
## Details

 Organize information about waves.



 Differentiate two main types of waves.

Mechanical Waves	Electromagnetic Waves

 Classify wave motion. Circle the type of motion that occurs in electromagnetic waves.

Type of Wave Motion	Description of Disturbance	Examples
		flag waving in a breeze; light waves
		sound waves
		water waves

### Main Idea

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### Details

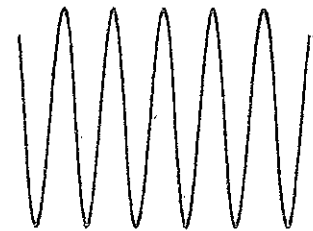
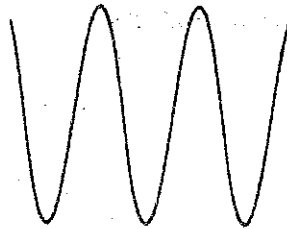
Contrast the motion of water waves and seismic waves.

Water Waves	Seismic Waves


### Properties of Waves

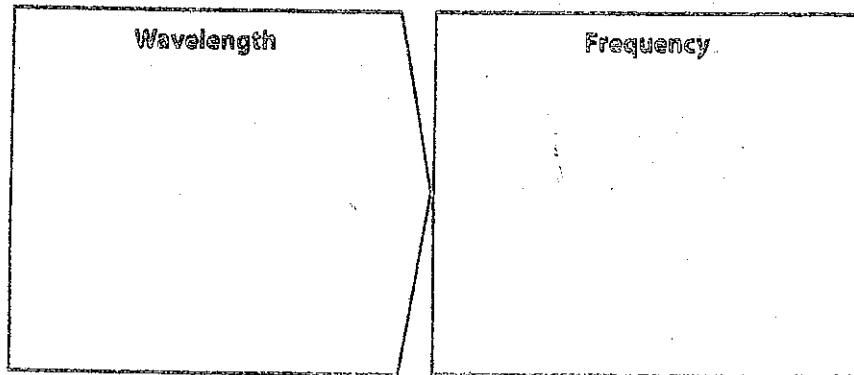
I found this on page \_\_\_\_\_.

 Interpret wavelength in the two transverse wave diagrams. Mark and label with descriptions one wavelength in each wave.



I found this on page \_\_\_\_\_.

 Relate wavelength to frequency.



### Main Idea

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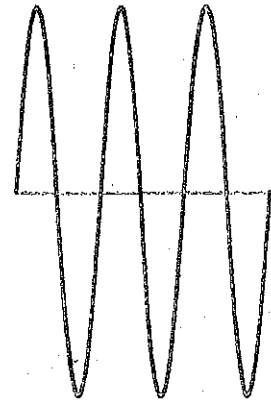
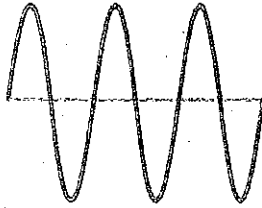
### Wave Interaction with Matter

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I found this on page \_\_\_\_\_.

### Details

**Key** Interpret amplitude and energy in the two transverse wave diagrams. Mark and label the amplitude in each wave, and identify it as having higher or lower energy than the other.



**Key** Describe ways that waves interact with matter.

Interaction	Description
Transmission	
Absorption	
Reflection	
Refraction	
Diffraction	

**Key** Analyze It Explain why you see rings form and grow outward when you drop a pebble through the surface of still water.

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**Directions:** Cut on the dotted lines then paste sheet into Science Interactive Notebook. Fold flaps up then write in proper vocabulary term where they belong on each wave.

### Wave Vocabulary:

Crest

Wavelength

Rest position

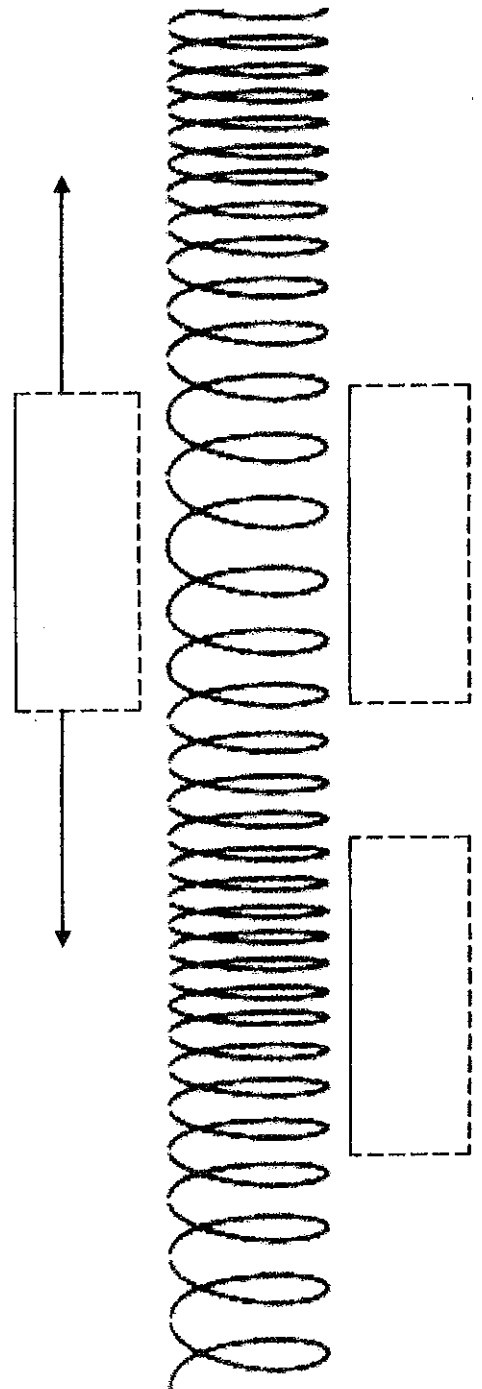
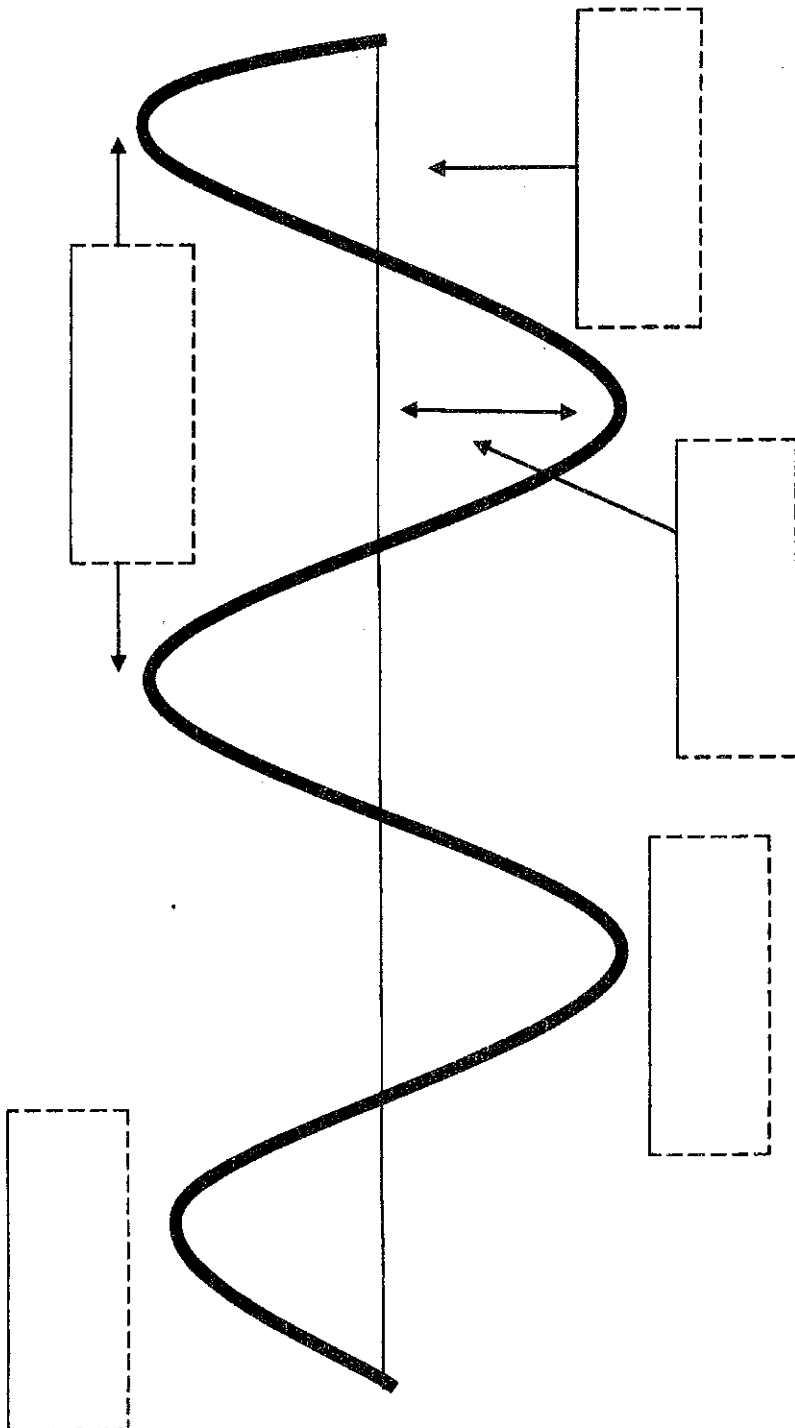
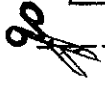
Trough

Amplitude

Compression

Rarefaction

Page  
8



## SCIENCE &gt; ENERGY &gt; SOUND

## FILL IN THE BLANK

Complete the following statements using words from the word bank.

AMPLITUDE    MOLECULES    COMPRESSION    SPEED    ABSORB    CYCLE  
FREQUENCY    DENSE    LONGITUDINAL    ECHO    RAREFACTION    OSCILLOSCOPE

1. Sound waves are made up of chains of vibrating .....
2. Sound moves in a(n) ..... wave.
3. A(n) ..... is a high-pressure area of tightly-packed molecules.
4. A(n) ..... is a low-pressure area of loosely-packed molecules.
5. The combination of a compression and a rarefaction creates one .....
6. A(n) ..... measures sound waves.
7. The reflection of sound waves off of a hard surface can create a(n) .....
8. Soft surfaces ..... sound waves.
9. .... measures the force of a compression and describes how loud a sound is.
10. Pitch is determined by sound wave's .....
11. Temperature affects the ..... of sound waves.
12. Sound waves travel farther through ..... media, such as water or steel.

# Brain POP<sup>®</sup> SOUND

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

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

Class: \_\_\_\_\_

1  How are ocean waves different from sound waves?

- A Ocean waves are transverse waves, sound waves are longitudinal waves
- B Ocean waves are longitudinal waves, sound waves are transverse waves
- C Ocean waves are electromagnetic waves, sound waves are mechanical waves
- D Ocean waves are mechanical waves, sound waves are electromagnetic waves

2 What are you doing when you're making sound?

- A Causing photons to travel
- B Causing air molecules to vibrate
- C Causing electromagnetic waves to radiate
- D Causing air pressure to drop

3 What is compression?

- A When air molecules move apart from one another
- B When air molecules collide with one another
- C When air molecules become packed tightly together
- D When air molecules move around freely

4 A sound wave of over 20,000 cycles per seconds is inaudible to humans. What does "inaudible" mean?

- A Loud
- B Shrill
- C Deep
- D Unable to be heard

5 What would a wave with a low amplitude sound like?


- A It would sound quiet
- B It would sound loud
- C It would sound tinny
- D It would sound deep

6 What is the relationship between frequency and sound?

- A Frequency affects a sound's volume
- B Frequency affects a sound's amplitude
- C Frequency affects a sound's loudness
- D Frequency affects a sound's pitch

7 Where would sound travel the slowest?

- A In New York City
- B In the pine forests of Georgia
- C At the North Pole
- D At the equator

8  To break the sound barrier, an airplane must travel faster than the speed of sound. Approximately how fast does an airplane have to go to do this?

- A 344 kilometers per hour
- B 344 meters per second
- C 344 centimeters per minute
- D 344 miles per hour

9 Which of these does sound travel fastest through?

- A Steel
- B Water
- C Air
- D Rock

10 Which of these would absorb the most sound?

- A 
- B 
- C 
- D 



## **AMPLITUDE, WAVELENGTH, AND FREQUENCY VIRTUAL LAB**

**How does the size of the ball on the plunger affect the amplitude of the waves?**

**What affect, if any, does increasing the speed of the plunger have on the frequency of the waves?**

**What affect, if any, does increasing the speed of the plunger have on the wavelength of the waves?**

**What is the relationship between the frequency and the wavelength of a wave?**

**What affect, if any, does frequency have on the amplitude of a wave?**

**What relationship exists between the amplitude of a wave and amount of disturbance in the water?**



Name:  
Date:

## Sound Energy

**Directions:** Answer every question; if you are unsure...write that you are unsure! ☺

1. All of the items listed below make sounds. Put an X next to the objects you think involve vibrations in producing sound.  
 guitar strings  
 drum  
 barking dog  
 flute  
 piano  
 screeching brakes  
 singer  
 hammer

Explain your thinking. What "rule" or reasoning did you use to decide which objects involve vibrations in producing sound?

2. Sound travels through all mediums (solid, liquid, and gas). How do the particles in a medium affect the way in which a sound travels?

Look at the two sound waves below. Label the amplitude and wavelength on each. Describe the sound you would hear from each and explain why.

