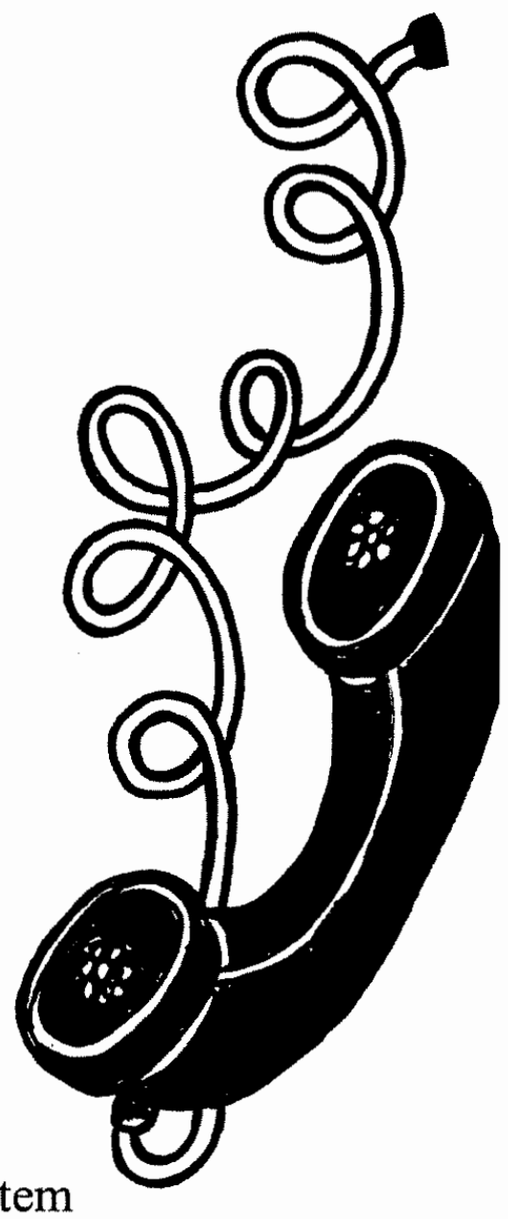
SOUND - Hearing And The Human Ear

UNIT OVERVIEW

In this fabulous unit, students learn everything they need to know about sound - and more! This highly practical and simple-to-use unit is broken into three parts. In "**Part I - Core Teaching Lessons**", students participate in meaningful activities associated with the core theme of each lesson, which are followed by related overhead notes. This section helps to convey the key concepts and learning outcomes, giving "structure" to the unit. "**Part II - Optional Lessons**" provides extra activities that teachers may wish to use for homework assignments, review or enrichment. "**Part III - Overhead Notes**", provides the information base for the unit and makes expensive textbooks completely unnecessary. Together, these three parts help to stress "process" in a fun filled-way that is sure to keep students interested, learning and motivated. This unit is so "sound" that students will love it!

PART I - CORE TEACHING LESSONS

1.	**What is Sound?**	-	Sound Wordsearch
2.	**How Is Sound Made?**	-	Do You Hear What I Hear???
3.	**How Sound Travels**	-	Telephone Time
4.	**The Speed Of Sound**	-	How Quick Is Your Pulse?
5.	**High Sounds/Low Sounds**	-	Make An Instrument
6.	**Loud Sounds/Soft Sounds**	-	It's Too Loud! - Worksheet
7.	**Reflection Of Sound**	-	Mosquito Munch
8.	**Uses Of Sound**	-	Sound Pictograms
9.	**The Human Ear And Hearing**	-	You Could Hear A Pin Drop
		-	Tin Can Eardrum
		-	Bat Races
10.	**The Human Voice And Speech**	-	Sound Crossword - Review



PART II - OPTIONAL LESSONS

1.	Drum Race	2.	Matching Review
3.	Homer Simpson's Vocal Range - Doh!	4.	Bell In A Vacuum Jar
5.	Glass-To-The-Wall Spy	6.	Paper "Ear-Trumpets"
7.	Build An Instrument	8.	The Ultimate Sound System
9.	Musician In The Class	10.	Class Musicians
11.	Magic School Bus - "Going Batty"	12.	Recorded Reading Aloud
13.	How Far Away Is The Storm?	14.	Hand Signal Alphabet

PART III - STUDENT NOTES

Basic information and concepts are conveyed using student notes. These notes can be put onto overhead transparencies, photocopied for the students, or simply written on the board for students to copy into their notebooks.

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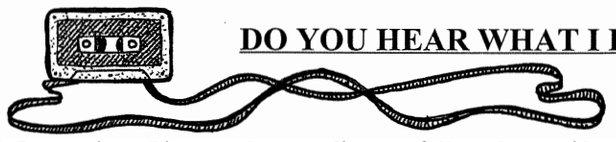

DO YOU HEAR WHAT I HEAR???

NAME: _____

Instructions: Listen to the recording carefully and try to identify each sound. (If you do not know a sound, be sure to skip to the next one.)

1) _____ 11) _____

2) _____ 12) _____

3) _____ 13) _____

4) _____ 14) _____

5) _____ 15) _____

6) _____ 16) _____

7) _____ 17) _____

8) _____ 18) _____

9) _____ 19) _____

10) _____ 20) _____

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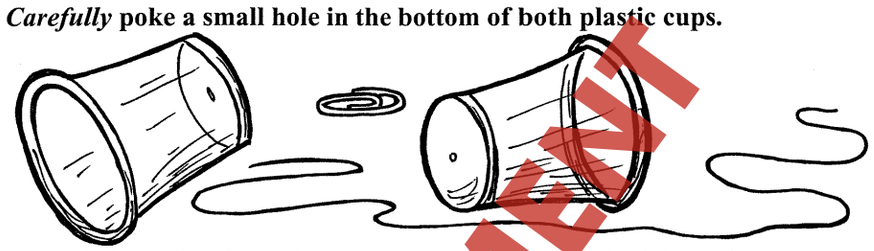
TELEPHONE TIME

NAME: _____

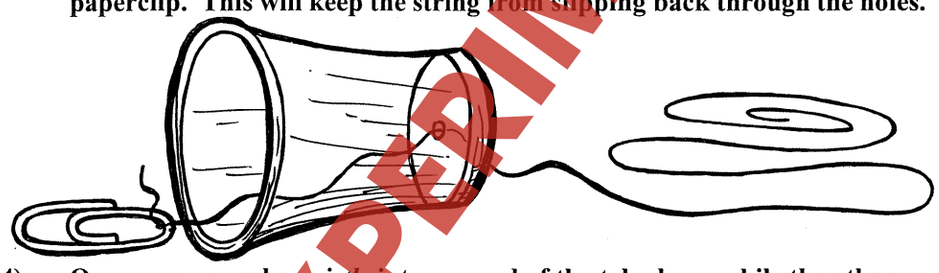
Instructions:

1) **Your task is to make a working telephone using two plastic glasses, two paperclips and three or four meters of string.**

2) ***Carefully*** **poke a small hole in the bottom of both plastic cups.**



3) **Thread the string through the holes and tie each end of the string to a paperclip. This will keep the string from slipping back through the holes.**



4) **One person speaks *quietly* into one end of the telephone while the other places the cup to their ear and listens.**

5) **Experiment to see if the telephone system works better or worse with a tight string compared with a loose string. Will the telephone work around corners?**

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MAKE AN INSTRUMENT

NAME: _____

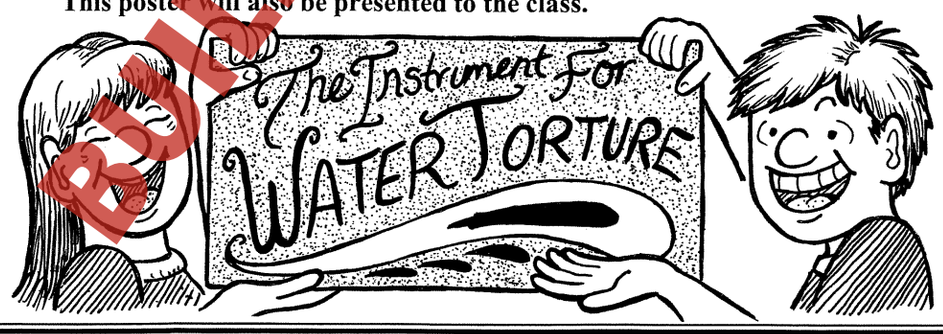
Instructions:

1) **Your task is to build a musical instrument using the materials provided by your teacher. Please don't make a giant mess!**

2) **The musical instrument must be able to play a simple scale (Doe-rae-mee-fa-so-la-tee-doe) As well, you must play a simple song on the instrument which will be presented to the class.**

3) **Each group must invent a name for their instrument.**

4) **Each group must draw and colour a poster advertising their instrument. This poster will also be presented to the class.**



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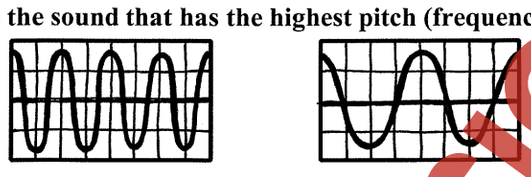
ITS TOO LOUD!

NAME: _____

Instructions: Answer the questions. Where possible, Answer In Full Sentences. (AIFS)

1) **Circle the sound that has the highest pitch (frequency).**



2) **Explain why the sound you circled in #1 had the highest pitch. (AIFS)**

_____

_____

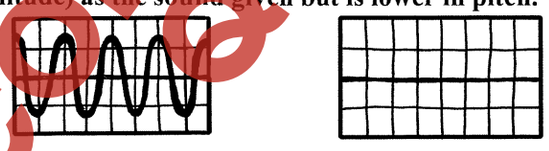
3) **Circle the sound that is the loudest (has the highest amplitude).**

4) **Explain why the sound you circled in #3 is the loudest. (AIFS)**

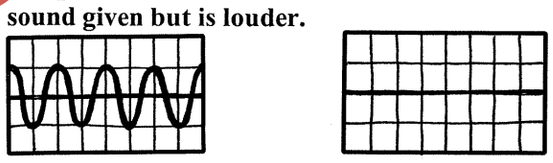
_____

_____

5) **In the box provided, draw a sound wave that has the same loudness (amplitude) as the sound given but is lower in pitch.**



6) **In the box provided, draw a sound wave that has the same pitch (frequency) as the sound given but is louder.**



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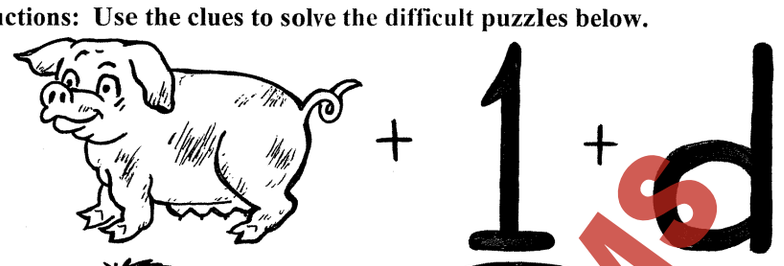
SOUND PICTOGRAMS

NAME: _____

Instructions: Use the clues to solve the difficult puzzles below.

1)

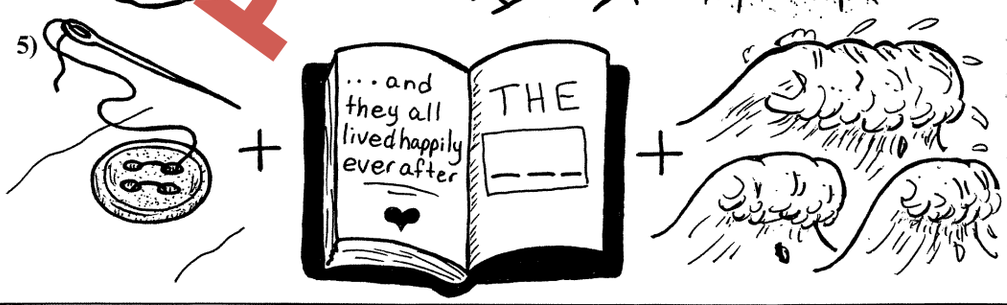


2)

3)

4)

5)



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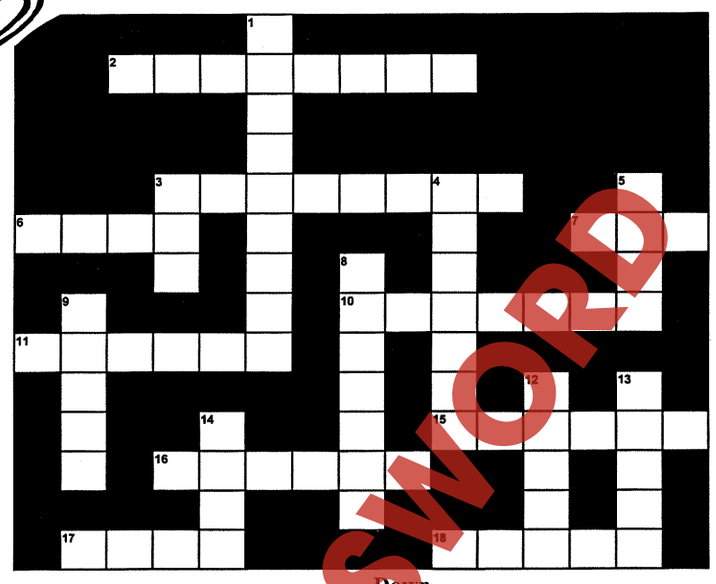
SOUND CROSSWORD

NAME: _____



CLUES

Across

2. Sound waves are created when an object does this.
3. The amplitude or "height" of a wave is a measure of this.
6. This happens when sound reflects off of a solid object.
7. Another name for the larynx is the voice _____.
10. A thin membrane that picks up sound vibrations in the human ear.
11. Sound, like light, heat and electricity, is one form of this.
15. Rabbits have large _____ to help them hear better.
16. A small bone in the middle ear - used to pound with.
17. The frequency of a low sound is *(more/less - choose one*)than the frequency of a high sound.
18. Used in human speech - vocal_____.

Down

1. How fast or slow an object is vibrating is called this.
3. When the frequency of a sound is low, the pitch will be _____.
4. A small bone in the middle ear - also used to help people ride horses.
5. Sonic _____!
8. Used to measure loudness.
9. A small bone in the middle ear - a blacksmith might hammer and shape a piece of iron on one of these.
12. The cochlea is part of this part of the ear.
13. Vibrating objects produce these.
14. These animals use echolocation to find food - also used in baseball.

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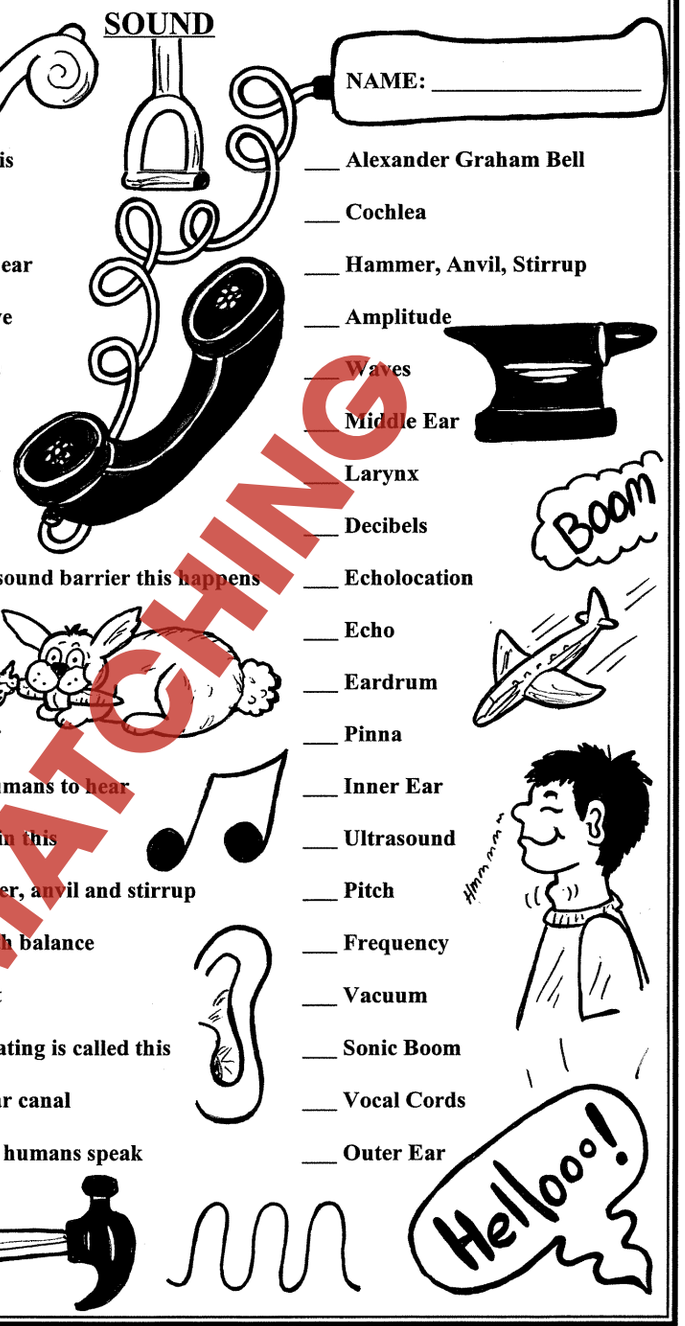
SOUND

NAME: _____

a) how high or low a sound is
b) sound travels in these
c) membrane inside middle ear
d) the height of a sound wave
e) used to measure loudness
f) inventor of telephone
g) tiny bone of the inner ear
h) a reflected sound wave
i) when a plane breaks the sound barrier this happens
j) voice box
k) how bats find food
l) small bones of middle ear
m) a sound too "high" for humans to hear
n) sound is unable to travel in this
o) contains eardrum, hammer, anvil and stirrup
p) besides hearing, helps with balance
q) these are large in a rabbit
r) how fast an object is vibrating is called this
s) made up of pinnae and ear canal
t) these muscles move when humans speak

___ Alexander Graham Bell
___ Cochlea
___ Hammer, Anvil, Stirrup
___ Amplitude
___ Waves
___ Middle Ear
___ Larynx
___ Decibels
___ Echolocation
___ Echo
___ Eardrum
___ Pinna
___ Inner Ear
___ Ultrasound
___ Pitch
___ Frequency
___ Vacuum
___ Sonic Boom
___ Vocal Cords
___ Outer Ear



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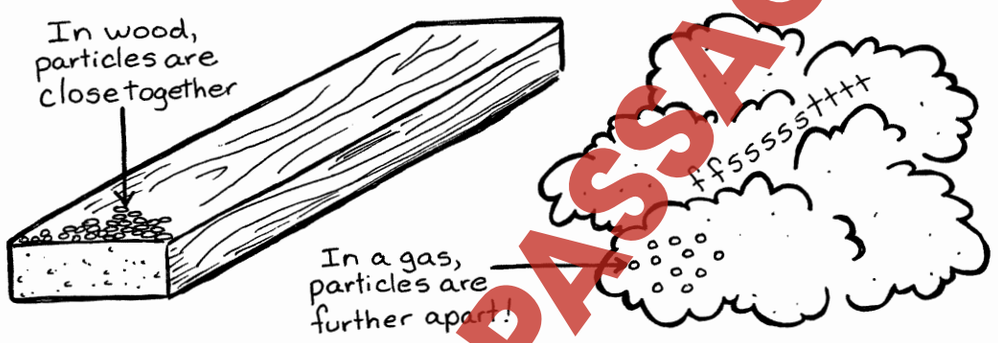
The Speed Of Sound

How fast sound travels though a material depends on the material, *not* the object making the vibrations. More dense materials like solids or liquids are made up of particles that are closer together. Sound travels fastest in these types of materials such as steel, wood or water. In gasses, the particles are much further apart, which causes sound to travel much more slowly.



Factfile: In air, sound travels at a speed of over 300 meters in one second! When a plane moves faster than the speed of sound (breaks the sound barrier) it creates an enormous shock wave in front of the plane called a "sonic boom". If the plane breaks the sound barrier too close to a city or town, windows can be shattered by the sonic boom it creates.

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SOUND WORDSEARCH

NAME: _____

K P K P D O V A L W I N D O W
H U Y V I B R A T I O N L C V
A P I T C H G H G I U A O O U
M M E N E R G Y T O N N U C E
M I P I N N A A S A Y V D H R
E V D L L E C A C C R I N L S
R O P D I O R R N A O L E E S
V V T S L T A E E M L L S A J
O A A O L E U R A Q F H S C D
I L H U M Q E D B R W E A Z O
C C X X E T Q A E F D A G E W
E O E R U T X D R G L R V P F
B R F O S T I R R U P I U E B
O D E C I B E L A R Y N X M S
X S O N I C B O O M N G M A Y

Find These Words:

AMPLITUDE	ECHOLOCATION	LOUDNESS	SOUND
ANVIL	ENERGY	MIDDLE EAR	STIRRUP
COCHLEA	FREQUENCY	OUTER EAR	ULTRASOUND
DECIBEL	HAMMER	OVAL WINDOW	VIBRATION
EAR CANAL	HEARING	PINNA	VOCAL CORD
EARDRUM	INNER EAR	PITCH	VOICE BOX
ECHO	LARYNX	SONIC BOOM	WAVES

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fter the "**Thunderstorm**" activity is over, explain to students that the new topic in science ill be "Sound".

his would be a good opportunity to review any expectations you have in regards to periments, as well as to explain the method used to evaluate or mark the students.

ommence with the student notes on the topic, "**What Is Sound?**". Students can copy these otes from an overhead or off of the chalkboard.

fter completion of the notes, students do the "**Sound Wordsearch**" to wrap up the lesson.

Answer Key

P K P D O V A L W I N D O W
U Y V I B R A T I O N L C V
P I T C H G H G I U A O O U
M E N E R G Y T O N N U C E
I P I N N A A S A Y V D H R
D L L E C A C C R I N L S
O P D I O R R N A O L E E S
V T S L T A E E M L L S A J
A A O L E U R A Q F H S C D
L H U M Q E D B R W E A Z O
C X X E T Q A E F D A G E W
O E R U T X D R G L R V P F
R F O S T I R R U P I U E B
D E C I B E L A R Y N X M S
S O N I C B O O M N G M A Y

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