Sound

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Name_____

Form_____

SOUND

Sounds are vibrations that can travel though different materials

In order to make a sound something has to **……**

With a drum, the **……** vibrates

With a guitar the **……** vibrates

With an organ the **……**vibrates

With a clarinet the **……** vibrates

The **pitch** of the sound is how high or low the sound is

The **volume** (or **loudness**) of the sound is how loud or soft it is

If the vibrations are faster (more vibrations in a second) the sound is higher
Slower vibrations make a lower sound

Larger (bigger) vibrations make a louder sound

Short, tight strings, like in a violin make a …… note *(high or low)*

Long, loose, heavy strings, like in a cello make a …….. note *(high or low)*

If we *tighten* the strings of a guitar the *pitch* will **increase** and the note gets **higher**

If we *pluck the strings harder* (or *hit a drum harder*) the *volume* will **increase** and the note gets **louder**

What do we mean by the PITCH of a note? .....

What will happen to the pitch of a guitar if we tighten the string? …….

What will happen to the volume of a drum if I hit the skin harder?.....

What vibrates when we play a clarinet ……

Draw a picture of a musical instrument you have made or studied

1. Explain how it works (say what is vibrating to make the sound)
2. Explain how you can alter the pitch (make it sound ***higher or lower***)
3. Explain how you can change the volume (make it play a ***louder*** note)

How Sound travels

In order for sound to travel the vibrations need to have a material to travel though.
The vibrations travel as sound waves through the air until the reach our ears

- Sound can travel through **solids**, like metal, stone and wood.
- Sound can travel through **liquids**, like water.
- Sound can travel through **gases**, like air.

If a bell is struck the metal starts to vibrate.
The vibrations travel outwards through the air like ripples in a pond

The sound travels through the air in the tube.

The tube stops the sound waves from spreading out so it sounds louder

Sound travels faster and better in solids and liquids than it does in air.

Place your ear on one end of a table (or ruler) and GENTLY tap the other end with your finger.

Do not tap loudly or bang the table or you may hurt your ears

Sound will NOT travel through a vacuum.

You will see an experiment where the air is sucked out of a flask containing a buzzer.

What happens to the volume of the sound as the air is removed?

We will not hear the sound of the moon exploding because there is no air in space between the earth and the Moon

Some sound facts

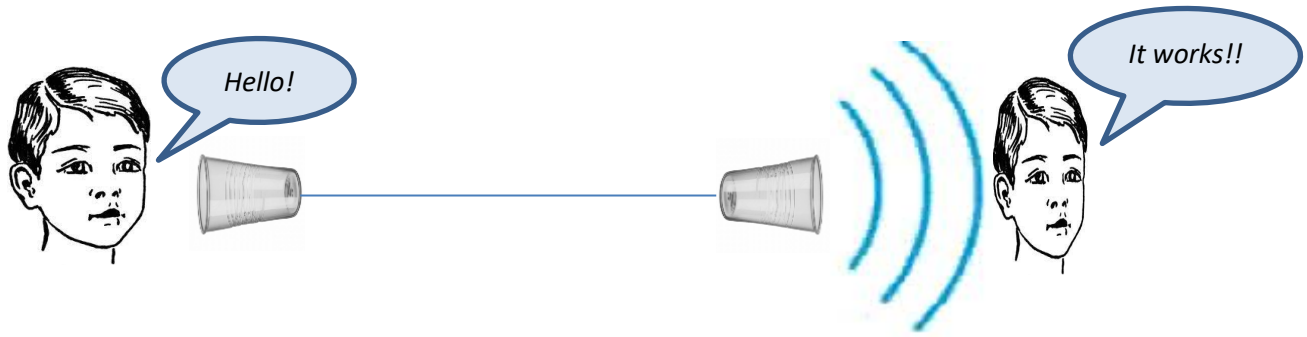
Echoes. An echo is heard when sound bounces back from a distant object.

Speed of sound (340 m/s) Sound travels much slower than light which is why we see a lightening flash before hearing it.

Sonar make use of echoes to measure the distance (or shape) of an object (eg the sea floor).
It does this by measuring the length of time it takes to hear the echo.

Ultrasound Ultra sound is a sound too high for us to hear. It is used to produce pictures of unborn babies.

A string telephone



A The person at A speaks into the cup

B Sound waves travel along the stretched string

C When the sound waves reach the cup they make the end of the cup vibrate which makes a sound

D The sound waves travel through the air until they reach the ears of the listening person

On the next page draw a picture of a string telephone and explain how it works

Sound Insulation

Devise an experiment to find the best sound insulator out of the three materials given to you

Apparatus:

A buzzer to make a sound

Instrument for measuring the volume of a sound

A cardboard tube

A ruler

What variable are you going to measure?

.....

What variable are you going to change?

.....

Describe one variable you will keep the same for each experiment

.....

Sound: assessment test **Date: ……**

1. What must an object be doing if it is making a sound?
.

……

2. A girl plucks a guitar string and listens to the note

a) What is vibrating to make the sound? …….
+
b) What does the sound have to travel through before we can hear it? ……

c) What would happen to the sound if the string vibrated quicker?

……

d) What could you do to the string to make the pitch higher?

……

5. Which would make a ***higher*** note on a guitar, a long string or a short string?.....

6. Which would make a ***lower*** note on a guitar, a loose string or a tight string?.....

7. How could we make a drum sound ***louder***?.....

8. What is meant by the ***pitch*** of a note?.....

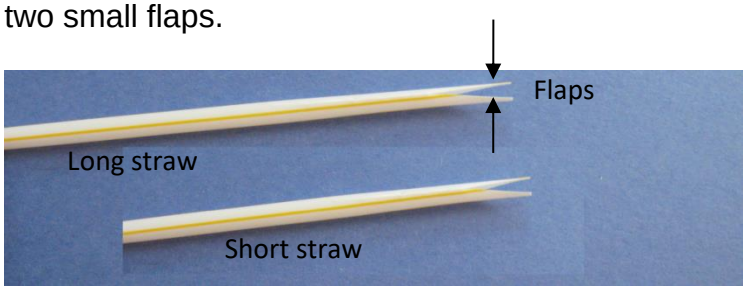
9. What is meant by the ***volume*** of a note?.....

10. A boy places one end of a ruler on a stopwatch and the other end against his ear and finds he can hear the watch ticking.

Explain how he hears the watch ticking

……

A boy makes an instrument from a plastic drinking straw by cutting the end into a point, forming two small flaps.



When he blew into the pointed end he heard a buzzing sound.

He repeated the experiment using a shorter straw

10 Which straw will make a higher note?.....

11. Name TWO things that vibrate to make the sound …… and…….

12. Explain why you would not be able to hear a rocket explode in space, however close you were

……

A girl stood near an alarm clock

13

How would the clock sound different if the girl stood further away?

……

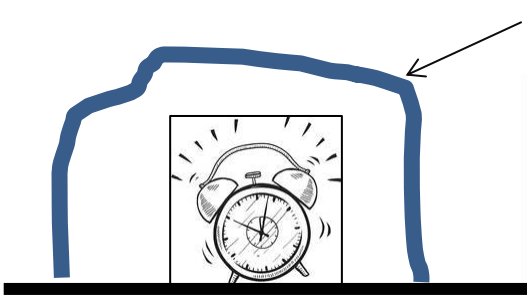
Some children wanted to find out which of their coats worked best as a sound insulator.
Hey put the clock in a thin box on a table and measured the volume of the sound coming from the clock using a sound level meter.

Number

A bigger number means a louder sound

Sound level meter

He covered the box with different coats and wrote down the number on the sound level meter for each of the coats he used. His results are shown in the table.



Type of coat	Number on the meter (Sound level)
No coat	75 dB
Hoodie	65 dB
Fleece	50 dB
T-shirt	71 dB

14. Which material do you think was the best sound insulator? ……

15. How can you tell ……

16. What should the children keep the same to make sure that this was a fair test?

……