Chapter 7: Sound

Worksheet 1: How sounds are made **Date:** / /

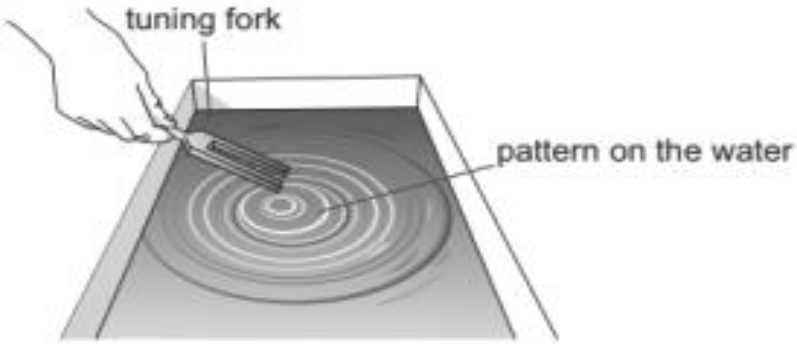
Objective/s:

- Investigate how sounds are made by vibrating sources.

Question 1:

Yuri hits the tuning fork to make a sound.

He puts the tuning fork on water.



Explain why there is a pattern on the water.

When we hit the tuning fork it vibrates, and when the vibrating fork touches the water the vibrations travel into the water causing the water particles to move.

Question 2:

Which of these statements is true?

Tick (✓) the **correct** box beside each sentence.

	true	false
Sound **can** travel around corners.	✓	
Sound **can** spread out in all directions.	✓	
Sound **cannot** travel through solids.		✓
Sound **can** travel through liquids.	✓	
Sound **can** travel in a vacuum.		✓

Question 3:

A vacuum is a space without any air or other matter.

Explain why sound cannot travel through a vacuum.

There is no matter in a vacuum, this means that there are no particles to vibrate, so sound cannot travel through vacuum.

Question 4:

The table shows the speed of sound through different materials. Use the table and the information to answer the questions below:

Material	Speed of sound (m/s)
Steel	6000
Water	1400
Air	355

a. In which material did sound travel the fastest?

Steel

b. In which material did sound travel the slowest?

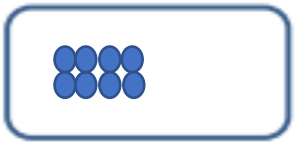
Air

c. Which material is a solid? Steel

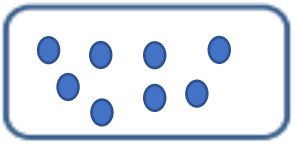
d. Which material is a gas? Air

e. Draw diagrams of how the particles are arranged in steel, water, and air:

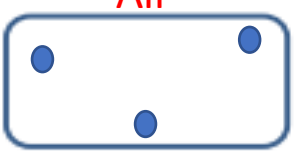
Steel



Water



Air



f. Use the diagrams to explain why sound has different speeds in different materials.

Sound travels faster in Water than Air, and even faster in Steel (solid), Because their particles are much closer together and can pass on the vibrations faster.

Question 5:

Angelique shakes a bell to make a sound.

(a) Complete the sentence.

The bell makes a sound because it Vibrates.

(b) Angelique shakes a smaller bell with the same force.

It makes a different sound to the larger bell.

Describe how the sound of the **smaller** bell is different.

The sound will be higher pitched.

(c) Angelique shakes the smaller bell with less force.

It makes a different sound.

Describe how the sound made with **less force** is different.

The sound is quieter – softer

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Worksheet 2: Volume and Pitch **Date:** / /

Objective/s:

- Describe sounds in terms of high or low pitch and loud or quiet volume.
- Investigate how to change the volume and pitch of sounds.

Question 1:

Drums are used to make sound.

Complete the sentences.

(a) The drum makes a higher pitch sound when the skin is .....

Tightly stretched

.....

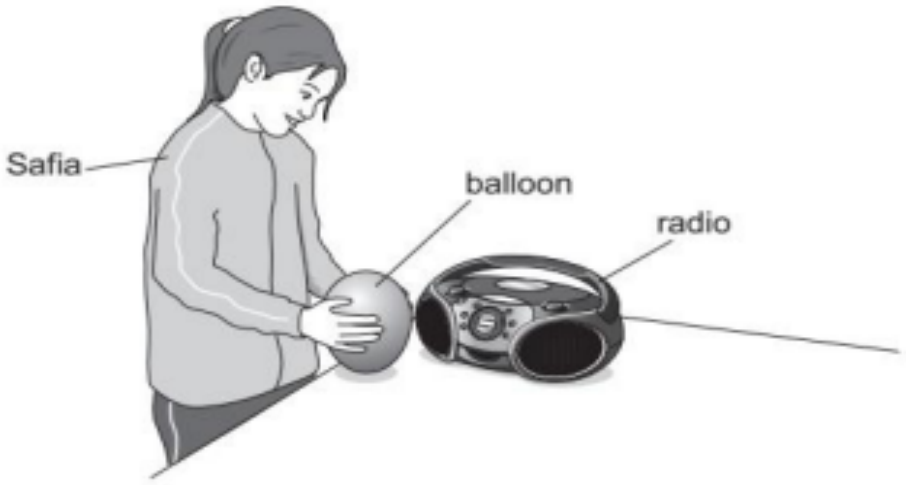
(b) The drum makes a louder sound when .....

We hit it harder or hit it with more force

.....

Question 2:

Safia investigates sound.



- She puts a balloon near a radio.
- She holds the balloon with her hands.

(a) The radio is switched on.

The radio makes a loud sound.

What does Safia feel with her hands?

Vibration

.....

(b) Safia wants to measure the volume of the sound from the radio.

What measuring equipment does she use?

Sound meter

.....

(c) Distance is measured in units called **metres**.

What **units** measure sound?

Circle the correct answer.

decibels **meterbels** **soundbels** **unibels**

Question 3:

Angelique plays the recorder.

(a) Complete the sentence.

Choose the **best** word from the following.

bounces **changes** **flows** **vibrates**

The air inside the recorder vibrates.

(b) Describe how Angelique changes the pitch of the sound from the recorder.

By opening or closing the holes with her fingers.

Question 4:

Jon stretches a rubber band between his fingers.
When he plucks it with his other hand it makes a sound.

(a) Why does the rubber band make a sound?

Because it vibrates

(b) How can he make the sound louder?

By plucking it harder or putting more force

(c) When he moves his fingers further apart the rubber band stretches more. This changes the pitch of the sound.

What is pitch?

It is the speed of vibration when an object vibrates.

(d) Underline the correct words to complete these sentences:

a) Sounds are **higher-pitched** / **lower-pitched** when the elastic band is stretched tightly.

b) Sounds are ***higher-pitched*** / ***lower-pitched*** when the elastic band is long.

c) Sounds are ***higher-pitched*** / ***lower-pitched*** when the elastic band is thin.

d) Sounds are ***higher-pitched*** / ***lower-pitched*** when the elastic band is short.

e) Sounds are ***higher-pitched*** / ***lower-pitched*** when the elastic band is thick.

f) Sounds are ***higher-pitched*** / ***lower-pitched*** when the elastic band is not stretched tightly.

Question 5:

(a) Anita plays the violin with a bow.

(i) How would she make the volume quieter?

Playing it with less force or by playing it very gently ..... [1]

(ii) What **two** things could she do to play a note with a higher pitch?

1 Shorten the strings with her fingers .....

2 Stretch the strings tightly ..... [2]

(b) Here are four statements about how a violin makes a note and the sound reaches our ear.

Put numbers in the boxes next to each statement to show their correct order.

The body of the violin makes the sound louder.	3
The sound carries vibrating air particles until they reach our ears.	4
The vibrations enter the body of the violin.	2
The violin string vibrates.	1

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Worksheet 3: investigating the volume of sound **Date: / /**

Objective/s:
- Identify control, independent and dependent variables.
- Draw a bar char

Faruk and Ali used a sound level meter to measure the volume of different sounds.

They held the sound level meter exactly the same distance away from each source of sound. These are their measurements of the volume of each sound:

Sound	Volume (dB)
Clapping hands	75
Blowing a whistle	80
Slamming a door shut	90
Class talking	65

After studying their investigation, answer the following questions:

1. Identify the **control, the independent and the dependent variables** in this investigation.

Control: Distance ……

……

Dependent: Volume ……

Independent: Source of sound ……

Variables that we must keep the same.

Variables that is measured.

Variables that we change.

2. Describe two ways in which the boys made their test fair.

1. They kept the same distance from sources of sound.

2. They must keep the same sound level meter.

3. Draw a bar chart below to represent their results.