

LISTEN, PLAY, CREATE - I

(LOMLOE)

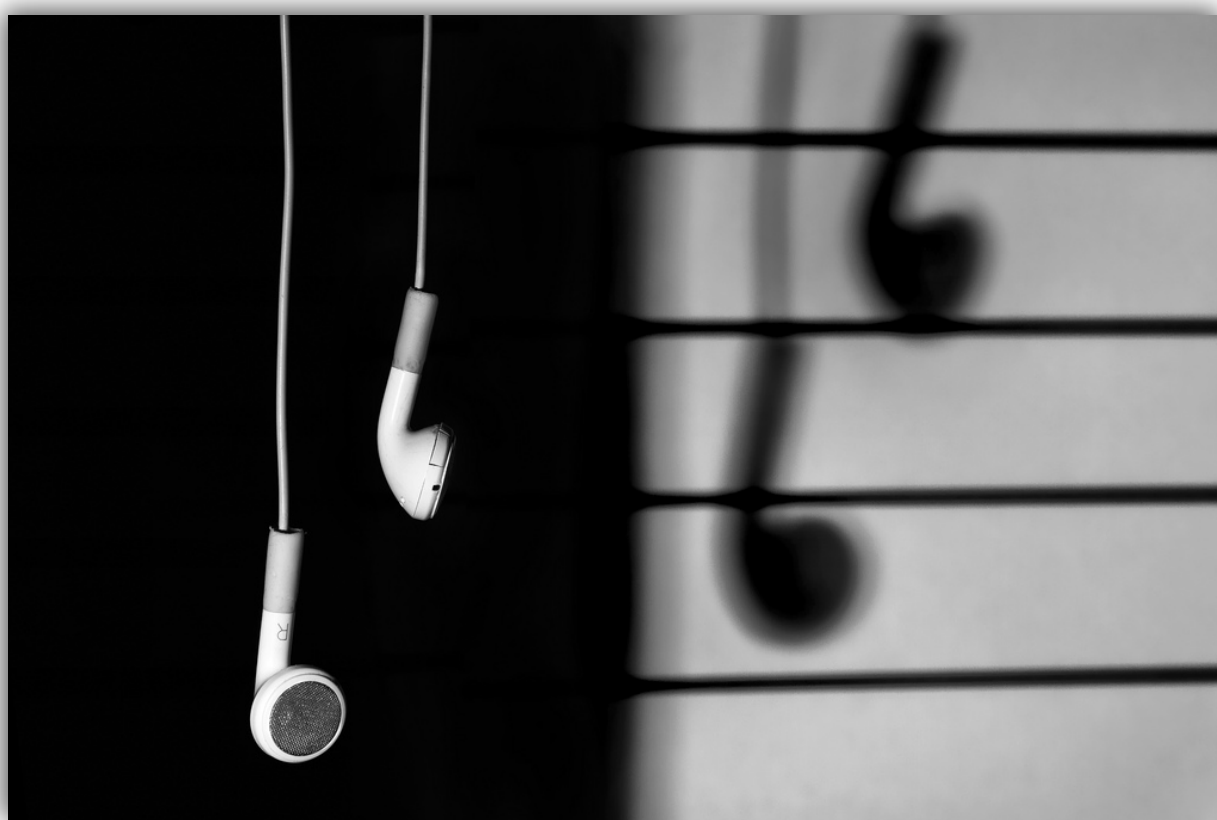


ESTER LÓPEZ CARRICHES

JORGE BENAYAS AYUSO

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Autores: Ester López Carriches, Jorge Benayas Ayuso.

Maquetación: Patricia Penavella Soto, Jorge Benayas Ayuso.

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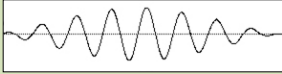
Mondúver, 9, bajo, 46025 Valencia

Tel: 963273517

E-Mail: educaliaeditorial@e-ducalia.com

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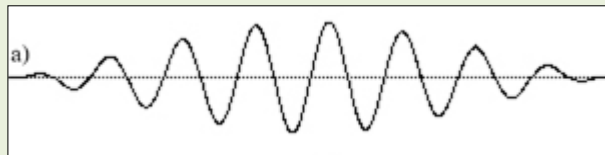
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LESSON 1.- WHAT IS SOUND?

1.- THE SOUND. PRODUCTION AND TRANSMISSION.

All sounds are **vibrations**. Those vibrations propagate as **waves** through a **medium** such as solids, liquids and gases. Sounds cannot propagate through the **vacuum** because the waves don't have a medium to pass through.



The **speed of sound** depends on the medium. For example, the speed of sound through air is around 340 meters per second (m/s). It is faster through water (more than 1,000 m/s) and the fastest through solids (more than 5,000 m/s through steel).

Sound and noise are physically the same. Noise is a sound that we don't like because it is unpleasant or because it disturbs us. That depends on our opinion.

Activity 1.- *Work in groups. Pick up one of the instruments below and explain to the rest of the class if you can see or/and feel with your fingers the vibration when you:*

- Pluck the strings of a guitar.
- Hit a cymbal.
- Hit a tambourine.
- Play a xylophone.

Activity 2.- *What happens when you stop the vibration of the instruments above?*

Activity 3.- *Where is sound propagating through when...*

- ...you hear while diving?
- ...you hear your neighbour through the wall?
- ...you feel and hear the tuning fork when it vibrates against your elbow?
- ...the Indians in the films lean their ears on the floor to hear the enemies coming?
- ...you can hear your friend with two plastic glasses joined by a tense string?
- ...you watch TV?

Activity 4.- *What is the speed of sound through air?*

Activity 5.- *What is the medium through which sound propagates the fastest?*

Activity 6.- *Where is there no sound and why?*

Activity 7.- *Classify in noises or sounds according to your opinion:*

A dog barking - The waves at the beach - The wind moving the leaves of a tree
A bird singing - An alarm - The school bell.

Add more noises or sounds and compare them with your partner.

Noises	Sounds

Activity 8.- *We are always hearing something. It is impossible to be in total silence although we think we are. Check it like this:*

Be quiet. Close your eyes for a minute and focus on the sounds or noises that you can hear. List everything that you heard. Compare with the things that your partners heard.

Activity 9.- *Listen to this excerpt and answer:*

Do you think this piece consists of sounds or noises?

Why?

Activity 10.- *Are these statements true or false?*

- a) Sound is a vibration that propagates as a wave through solids, liquids and gases.
- b) The speed of sound through water is around 340 m/s.
- c) Noise is a pleasant sound.
- d) There are sounds everywhere in the Universe.

2.- PROPERTIES OF SOUND

The four properties or characteristics of sound are:

pitch, duration, timbre (also called tone colour) and intensity.

A) The pitch refers to **high-pitched or low-pitched sounds**. It depends on the **frequency**. The frequency is the number of vibrations per second. Its unit is the hertz (Hz). A high sound has a high frequency, a lot of hertz. A low sound has a low frequency, few hertz.

Human beings can't hear all frequencies. We can't hear frequencies lower than 20 vibrations per second (20 Hz). We name those sounds **infrasounds**. Some animals such as dolphins and whales can hear them. We can't hear frequencies higher than 20,000 vibrations per second (20,000 Hz). We call them **ultrasounds**. Some animals such as dogs and bats can hear them.

The **tuning fork** is made of metal. When it vibrates it always produces 440 vibrations per second (**440 Hz**). We call that sound **la or A**. It is like a compass in music. The instruments can be tuned from that note and it is useful for the choirs, too.

As a general rule, small instruments have high-pitched sounds and big instruments have low-pitched sounds. For example, a violin is higher than a bass because it is smaller.

(*Remember: **Large-Low**)

Women have higher voices than men because their vocal cords are smaller.



Activity 11.- Complete the sentences:

The pitch refers to _____. It depends on the _____.

Activity 12.-What is frequency and what is hertz?

Activity 13.-Has a high-pitched sound a high frequency?

Has a low-pitched sound few hertz?

Activity 14.-Where do you find the low-pitched sound in a keyboard or a xylophone: to your left or to your right?

Which are the high-pitched keys, the short keys or the long keys?

Activity 15.- How many holes do you have to cover to get the lowest pitch with the recorder?

Activity 16.- Do women have a higher or a lower voice than men?

Why?

Activity 17. Classify these sounds into low or high and add another example of every kind.

School bell - A door slam - Motor - Siren - Bird - Thunder

Low	High

Activity 18. How do we name the sounds higher than 20,000 Hz?

Which animals can hear them?

How do we name the sounds lower than 20 Hz?

Which animals can hear them?

B) The duration refers to **long and short** sounds.

C) The timbre or tone colour allows the listener to identify the instrument, the voice or object that is producing the sound.

If a piano and a violin play the same pitch, with the same volume and the same duration, we differentiate them thanks to their timbre. It depends on the material that vibrates and the specific components of the sound waves.

D) The intensity or volume refers to **loud and soft**. It depends on the **amplitude** of the sound wave.

Don't mix up pitch and intensity: a sound can be high and loud or high and soft, low and loud or low and soft.

We live surrounded by sounds of different volumes. Think of examples in your daily life that are soft or very soft, intermediate, loud and very loud:

- Soft and very soft:
- Intermediate:
- Loud:
- Very loud: