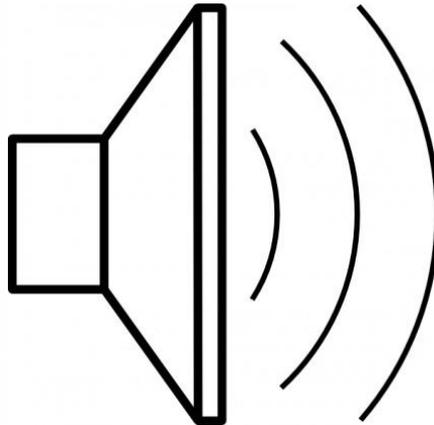
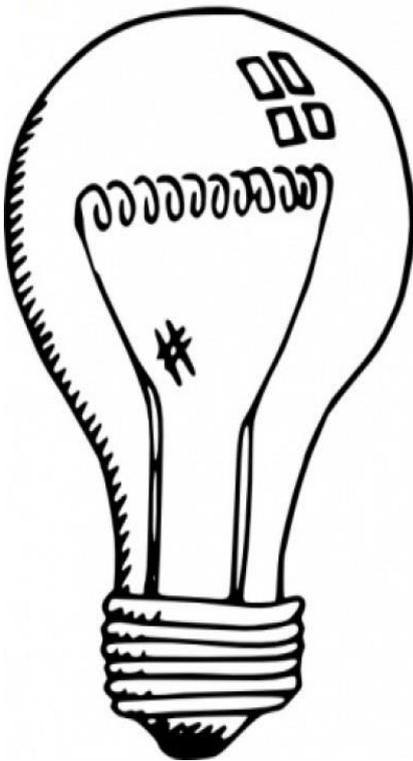


TOPIC 15: SOUND AND LIGHT



Contents:

1. What is sound?
2. How do we measure sound?
3. How does the ear perceive sounds?
4. How is sound reflected?
5. Sound pollution
6. What is light?
7. Properties of light
8. How is light refracted?
9. Lenses.

Full name:
Date:
Class:
School:
Teacher:

Vocabulary

A

- amount: medida

B

- bounce off: rebotar

C

- change: cambiar

D

- damaging: dañino

E

- exposed: expuestos

F

- fast: rápido
 - faster: más rápido
 - floor: suelo
 - found: encontrado
 (is found: se encuentra)

G

-

H

- hairdryer: secador
 - health: salud

I

- inside: dentro de

J

-

K

- kind: clase, tipo

L

- loudspeaker: altavoz

M

- map: cartografiar, dibujar
 - mean: significar
 - measure: medir
 - measurement: media
 - meet: encontrarse

N

- noise: ruido
 - noise pollution: contaminación acústica

O

-

P

-

Q

-

R

- rays: rayos

S

- scan: analizar, escanear
 - scientist: científico
 - short-sighted: miopes
 - sound: sonido
 - stressful: estresante

T

- thick: grueso
 - thicker: más grueso
 - through: a través de
 - travel: viajar

U

- understand: entender
 - used: usado (is used: se usa)

V

- vacuum: vacío

W

- washing machines: lavadoras
 - waves: ondas
 - which: que, la cual

X

-

Y

-

Z

-

1.- What is sound?

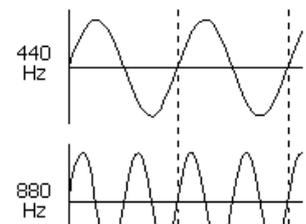
By sound we understand a form of mechanical energy which is produced by the vibration of an object. We can hear sound with our ears.

Sound travels in waves through solids, liquids and gases. It always travels in a medium and it never travels in a vacuum. Scientists say that sound travels much faster through solids than gases.



2.- How do we measure sound?

The frequency is the magnitude that measures the amount of vibrations of an object per second. Its unit of measurement is the hertz (Hz)



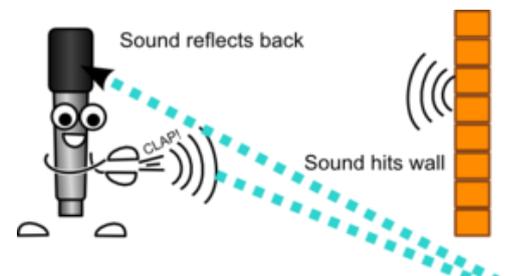
3.- How does the ear perceive sounds?

The ear is made of three sections:

- the **outer ear** collects sounds. It includes the ear canal where wax is produced to fight off illnesses.
- the **middle ear** turns the sounds into vibrations. It has got three tiny bones called malleus, incus and stapes. They
- the **inner ear** sends sound signals to the brain.

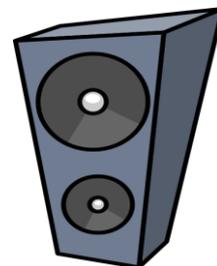
4.- How is sound reflected?

Sound is reflected when it meets an obstacle. Then, the sound waves bounce off and changes direction. The sound waves are used to scan inside the human body or to map the sea floor. The reflection of sound produces echo.



5.- Sound or noise pollution

Sound or noise pollution occurs when people or animals are exposed to levels of sound that are stressful or damaging for hearing. It means that noise pollution is bad for our health. The origin of noise pollution is found in road traffic, trains, shopping centres, discos, loudspeakers, washing machines, hairdryer...



loudspeaker **hairdryer**

Activity one. Are these sentences True or False? Correct the false statements.



- 1.- Sound usually travels in a vacuum. _____
- 2.- Road traffic produces noise pollution. _____
- 3.- Echo is the repetition of sound by reflection of sound waves. _____

Activity two. Fill in the gaps with the present simple or present continuous of the verbs below.



-produce -study -meet -watch -travel -measure

- 1.- Scientists say that sound is reflected when it _____ an obstacle.
- 2.- How _____ we _____ sound? In hertz.
- 3.- Look! Peter _____ the human ear because he has an exam tomorrow.
- 4.- Road traffic, planes and trains _____ noise pollution.
- 5.- Scientists say that sound always _____ in a medium.
- 6.- My grandparents _____ a documentary about sound pollution on the net.

6.- What is light?

It is a kind of energy called electromagnetic radiation. We can see light with our eyes. Light can come from a natural source like the sun or an artificial source like a bulb. Objects can be:

- **transparent:** light passes through an object.
- **translucent:** some light passes through an object.
- **opaque:** no light passes through an object.



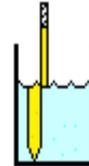
7.- Properties of light.

It travels fast and in straight line. The speed of light depends on the medium but it is around 300.000 kilometres per second.

8.- How is light refracted?

Refraction of light is the change of direction that a light ray suffers because the density is different in air and water. It means that light travels with different speed. Water is denser than air, so light is refracted when it travels through the surface of the water. The pencil in the photo is partly under water. That's why it appears to be broken.

The Broken Pencil Observation



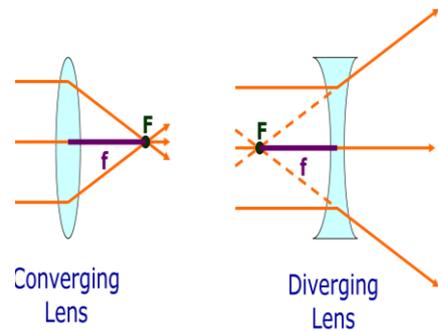
9.- Lenses

Lenses are discs made of glass or plastic with one or two faces. They refract light. There are two types:

- **Converging lenses:** they are thicker at the centre than at the edge. They concentrate the rays of light

- **Diverging lenses:** they are thicker at the edge than at the centre. They disperse the rays of light. For example, people who are short-sighted have these kinds of lenses in their glasses.

Lenses



Activity three. Are these statements TRUE or FALSE. Correct the false ones:



- 1.- A bulb is a natural source of light. _____
- 2.- When an object is opaque, some light passes through an object. _____
- 3.- Light travels with the same speed in water and air _____
- 4.- Diverging lenses refract light _____
- 5.-The outer ear collects sounds _____

Activity four. Finish the sentence in a logical manner.



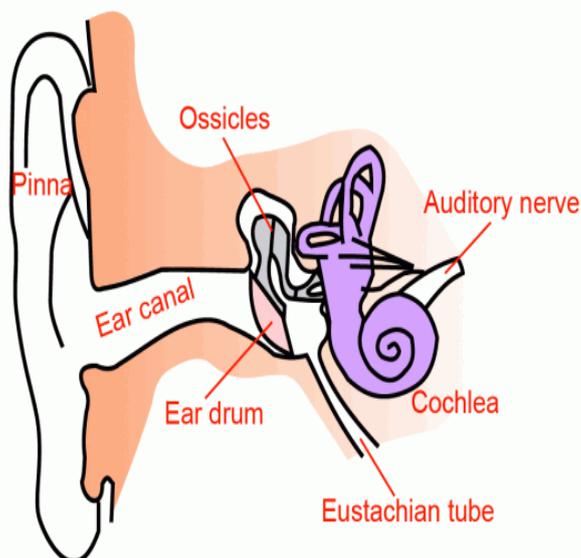
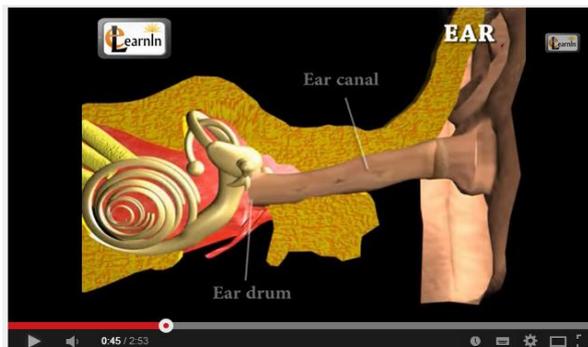
- 1- Converging lenses concentrate the rays of light because _____
- 2.- Short-sighted people wear diverging lenses because _____

Activity five. WATCH AND LISTEN up to minute 0.56. This 3D animation video is about human ear. Fill in the gaps.

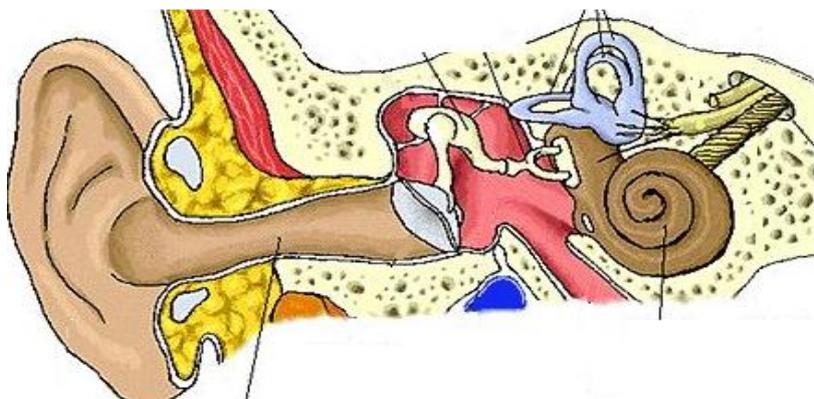
<https://www.youtube.com/watch?v=p3Oy4lodZU4>



- 1.-The ear is that part of the human body that detects sound from the _____ and delivers it to the _____.
- 2.- With the help of the _____ humans have the ability to locate the _____ of sound.
- 3.- The ear also plays a major role in maintaining a proper _____ and position of the _____.
- 4.- Sound is actually caused when air molecules are set into _____.
- 5.- One can hear the sound when the ear picks up or feels these vibrations or _____.
- 6.- There are nine main parts of ear that include: the pinna, the ear _____, the ear _____, the hammer, anvil, stirrup, _____, Eustachian _____ and the _____ nerve.



Activity six. Use the words from the box and label the parts of the ear.



- ✓ Stirrup
- ✓ Eardrum
- ✓ Semi circular Canals
- ✓ Hammer or malleus
- ✓ External ear
- ✓ Ear canal
- ✓ Cochlea
- ✓ Anvil
- ✓ Auditory nerve