Light and Sound

Light and sound are found everywhere. **Light** is apparently **visible** to the human eye and is responsible for the sense of **sight**. It is a form of **energy** we can see when it is reflected off the surface of an object. **Sound** is a mechanical vibration that can pass through solids, liquids, and gases and can usually be identified by the sense of **hearing**.

Light travels as waves through the air from place to place in straight lines. These are transverse waves. It is believed that light travels faster than anything in the universe. It travels at a speed of 186,000 miles per second and unable to travel through solids, but it can travel through liquids and gases.

There are two properties of light. **Reflection** which occurs when light bounces off a surface which then allows the object to be visible to the eye. For example, when the moon is seen in the sky, it is because the light from the sun reflects off the surface of the moon. A light ray comes off a surface at an equal angle to the angle at which it strucks the surface.

The second property of light is called **refraction**. It occurs when a ray of light passes from a transparent medium to another transparent medium such as from air to water, it changes speed and the way it **bends**. For example, when a pencil is placed into a glass of water, the pencil will seem like it is broken into two pieces. Because the light is traveling through the water, there is refraction, and the light bends causing the pencil to look like it is in two pieces.

Different views aimed to explain the nature of light and the process of vision. This had been in circulation for centuries mainly among classical Greek thinkers. Some said rays came out of the eyes, while others thought something entered the eyes to represent an object. But it was the 11th-century scientist Ibn al-Haytham who undertook a systematic critique of these ideas about vision in order to demonstrate by both reason and experiment that light was a crucial, and independent part of the visual process. He thus concluded that vision would only take place when a light ray issued from a luminous source or was reflected from such a source before it entered the eye.
Through this remarkable work on optics which was based on reasoning rather than abstract , he has been considered as the father of modern optics.

All sounds are different, but one thing in common is that sounds are created by something that **vibrates**. Sound is **constantly** being **reflected** off many different surfaces. Thus, it can lead to the phenomenon called **echo**. The human brain keeps a sound in memory for up to 0.1 seconds. If a reflected sound wave reaches the ear within 0.1 seconds of the initial sound, then it seems to the person that the sound is ***prolonged***. Not to mention, **Refraction as a property** of waves which involves a change in the direction of waves as they pass from one medium to another. Refraction, or bending of the path of the waves, is accompanied by a change in speed and the wavelength.

Sound waves can travel through solids, liquids, and gases. It travels through solids much faster than through liquids or gases, and faster in liquids than gases because of the molecules that make up a solid are closer together allowing the sound to travel faster. **Unlike,** In a liquid,

the molecules are somehow farther apart, so the sound waves travel slower. In a gas, the molecules are spread farther apart so the sound waves travel much slower. Hence, sound travels through a solid can be better heard than traveling through a gas. This is why music can be heard from the speakers. The speed of sound travels much slower than the speed of light.

In summary, light and sound is everywhere. Light is a form of energy we can see when it is reflected off the surface of an object. Sound is a mechanical vibration that can pass through matter. It is well known that Sound travels through solids much faster than through liquids and gases.

1- Pre-reading tasks: Answer the following questions, before reading the text.

1. Discuss the title of the text.
2. What do you think the text will be about?
3. How can you describe the existence of both light and sound?

2- While reading tasks:

1. Silently, read the text progressively, building your understanding, paragraph after paragraph.
2. Search and Provide a simple definition for the meaning of the words that are in **bold** character in the text while you are reading.
3. Write the main idea of each paragraph you have finished reading.
4. Discuss these ideas.
5. Answer the following question:
6. According to the text, what are the characteristics of light and sound?
7. What is considered as a mechanical vibration?
8. What is the explanation of the vision, how the human eye see?
9. What is the type of light waves?
10. Can light and sound travel through matter?
11. Can they be reflected and refracted?

Are the following statements true or false?

1. Light travels at the same speed as sound.
2. Sound travels faster than light.
3. Light bounces off a surface which then allows the object to be visible to the eye.
4. Reflection explains light waves bending as it passes through water.

3-Homework:

4. Do the same reading tasks at home with the paragraphs that you have not discussed in the classroom.

10_ Do some research and answer the following question: through history, who fully explained the process of vision" how can vision occur " ?