CLIL Work Sheets		Teacher: Mizeraki Charikleia
Subjects involved:	**Physics: Mechanical Waves**	**Grade: 3rd Gymnasium**
Unit or topic:	**Excitation of Mechanical Waves and Types of Mechanical Waves**	

Mechanical Waves: Work Sheet 1: What is a Mechanical Wave?

A1. What shape do you have in mind, connected with the word "wave"? Draw it below.

A2. Is this picture static (as you imagine it) or not?

B. Watch the following "applet":

https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_el.html

showing a wave on a linear medium (like a string)

-Where does the wave propagate?

……

-Doesthe mass of the medium changes position as the wave propagates, or it just vibrates around a certain position?

……

-"Who" provides the energy for this wavy motion along the medium?

…….

-What is necessary for the excitation of the wave?

…….

…….

…….

(Circle the correct answer)

-When the particles (or molecules) of the medium are tightly connected, the wave propagates *faster*/ *slower*?

-When the particles (or molecules) of the medium are loosely connected, the wave propagates *faster*/ *slower*?

Concluding:

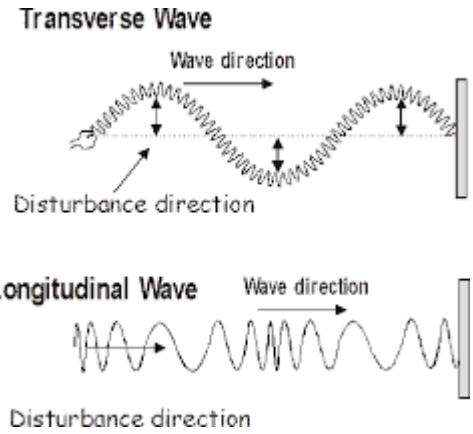
A. A **Mechanical Wave** is a **transportation of Energy** [Flow of Energy and NOT flow of Mass]

B. Excitation and wave propagation

A **Vibrating source** and a continuous **medium,** with loosely or tightly connected molecules that disturb each other and propagate the vibration, are necessary for the production and the propagation of a mechanical wave.

C. The Energy of the wave is provided by **the source**.

Mechanical Waves: Work Sheet 2: Types of waves



Look at the figure above and watch the following simulations

1. http://photodentro.edu.gr/v/item/ds/8521/1611 (or use of "wave springs")

2. **http://photodentro.edu.gr/v/item/ds/8521/1666** (or use of "wave springs")

What are the two directions that we observe on those different types of waves?

……

……

……

……

TYPES OF WAVES

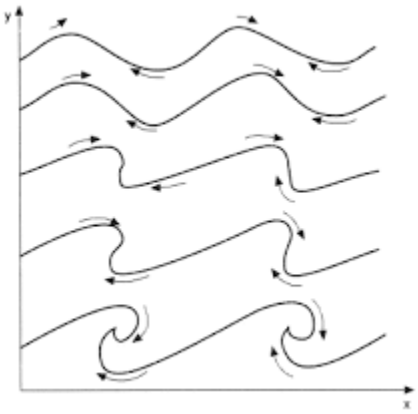
1. When those directions are parallel, the wave is called:……

……

2. When those directions are perpendicular, the wave is called:……

……

3. The following figure, shows the third type of waves that are called **surface waves.**



Can you describe the movement of the particles of the material?

……

……

……

……

Transverse waves propagate only in **solid materials**, although **longitudinal waves** propagate in gas**, liquid and solid materials.**

Most common examples of waves: (a) **sound waves** and (b) **seismic waves**.

<u>Concluding:</u>

(i)longitudinal or compressional waves (P-waves):

The direction of displacement is parallel to the direction of propagation.

(ii) transverse or shear waves (S-waves):

The direction of displacement is perpendicular to the direction of propagation.

(iii) surface waves:

Waves of this type e.g. sea surface waves are more complicated because of the complicated motion of the surface particles of the water. Sea surface waves occur by combination of transverse and longitudinal waves.

When the source (e.g. the wind) is powerful, the movement of the particles becomes circular.]

Most common examples of waves: (a) **sound waves** and (b) **seismic waves**.