

كلية العلوم

القسم : الفيزياء

السنة : الثانية



١

المادة : لغة تخصصية ١

المحاضرة : الثانية

{{{ A to Z مكتبة }}}
مكتبة A to Z

مكتبة A to Z Facebook Group

كلية العلوم ، كلية الصيدلة ، الهندسة التقنية

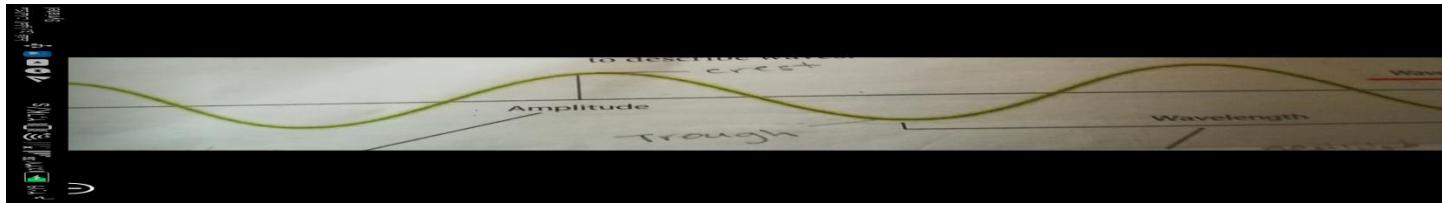
يمكنكم طلب المحاضرات برسالة نصية (SMS) أو عبر (What's app-Telegram) على الرقم 0931497960



How can we describe a wave ?

1 - By its Amplitude : Amplitude is a measure of how far the particles in the medium move away from their rest position

It is half of the difference between the highest and lowest values .



2 – By its wavelength : The wavelength is the distance from any point on a wave to an identical point on the next wave .

Wavelength measures the length of one cycle , or repetition.

3 – By its frequency : The frequency of a wave tells how many cycles occur in an amount of time . Frequency is expressed in hertz (Hz) .

One hertz is equal to one cycle per second . **The wave period** : It is the time required for one cycle .

Frequency and period are related , frequency is the inverse of period .

$$\text{Frequency} = \frac{1}{\text{period}}$$

Frequency is equal to the numbers of cycles per unit of time

$$\text{Frequency} = \frac{\text{number of cycles}}{\text{time}}$$

What affects the energy of a wave ?

1 - The amplitude or the frequency : For mechanical wave , amplitude is related to the amount of energy the wave carries . Greater frequency can also mean greater energy in a given amount of time .

For most electromagnetic (EM) waves , is most strongly related to frequency .

2 – Energy loss to a medium : A medium may not transmit all the waves energy . The medium may warm up , shift , or change in other ways .

3 – Energy loss due to spreading : waves usually spread out in more than one dimension . As each wavefront moves farther from the source , the energy is spread over a greater area .

If you measure a wave at a point farther from the source , you measure less energy . But the total energy of the wavefront stays the same .

What determines the speed of a wave ?

1 – The medium in which it travels :

The speed at which the wave travels - called wave speed – depends on :

a – The interaction of the atomic particles of the medium .

Waves travels faster in solids than in liquids and faster in liquid than in gases .

b – Wave speed depends on the density of the medium . in gases wave speed depends on temperature as well as density . Electromagnetic waves travel the same speed in empty space .

2 – Its frequency and wavelength :

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{Wave speed} = \frac{\text{wavelength}}{\text{wave period}}$$

$$\text{Wave speed} = \text{frequency} * \text{wavelength}$$

$$\text{Wavelength} = \frac{\text{wave speed}}{\text{frequency}}$$

Do the Math :

Wave speed m/s	Frequency HZ	Wavelength m
20		5
75	15	
	23	16



مكتبة
A to Z