

Al-Mustaqbal University Colleg  
Medical Physics Department



# General Physics/ lecture 9

First stage

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**2021-2022**

# Lecture 9

## Outline

- Nature of light
  - Reflection
  - Refraction.
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### Nature of light

- ✓ Light is a transverse, electromagnetic wave that can be seen by the typical human. The wave nature of light was first illustrated through experiments on diffraction and interference. Like all electromagnetic waves, light can travel through a vacuum.
- ✓ In physics, there are two theories by which light can be defined: the first theory defines light as particles and the second theory as waves. When considering measurement equipment such as spectra[radio]meters, which measure light in wavelengths, the second theory is the most suitable to explain light.

There are 7 basic properties of light:

- ✓ Reflection of light.
- ✓ Refraction of light.
- ✓ Diffraction of light.
- ✓ Interference of light.
- ✓ Polarization of light.
- ✓ Dispersion of light.
- ✓ Scattering of light.

## The Nature of Light

- Light consists of perpendicular electric and magnetic fields propagating through space in a third perpendicular direction.
- Light has a "dual nature" – it is both a particle called a photon and a wave. We perceive the wavelength of light as color.
- The speed of light in a vacuum is the fastest possible speed

$$c = 3 \times 10^8 \frac{m}{s}$$

- The frequency of light is inversely proportional to the wavelength and proportional to the energy.

$$\lambda = \frac{c}{f} \quad E = hf = \frac{hc}{\lambda}$$

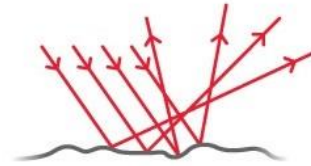
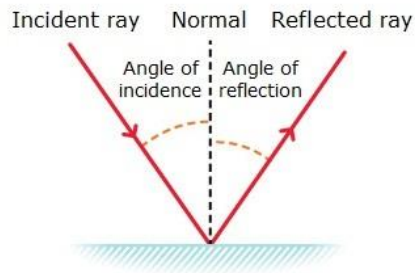
### Reflection

What is Reflection of Light? Reflection of light (and other forms of electromagnetic radiation) occurs when the waves encounter a surface or other boundary that does not absorb the energy of the radiation and bounces the waves away from the surface.

Mirror reflection

Specular reflection

Diffuse reflection



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## Refraction.

refraction, in physics, the change in direction of a wave passing from one medium to another caused by its change in speed. For example, waves travel faster in deep water than in shallow.

# REFRACTION

