

ECOLOGY LAB 2

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Light (Solar Radiation)

- Light is electromagnetic radiation come mainly from the sun, Sunlight provides the energy that green plants use to create sugars mostly in the form of starches, which release energy into the living things that digest them. This process of photosynthesis provides virtually all the energy used by living things.



Sunlight
+
Carbon dioxide
+
Water

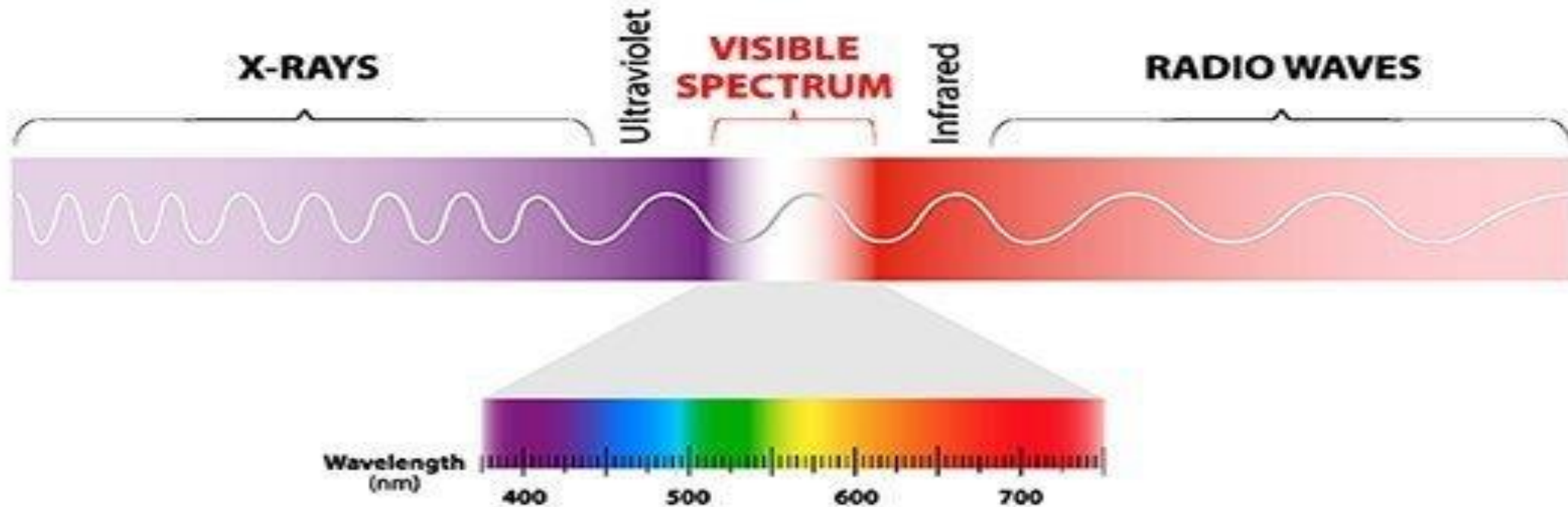
Photosynthesis

Glucose
(sugar)
+
Oxygen

Light include:

1. Visible light is the portion of the electromagnetic spectrum that is visible to the human eye. Electromagnetic radiation in this range of wavelengths is called visible light or simply light. A typical human eye will respond to wavelengths from about 390 to 700 nanometers.
2. Infrared radiation (IR) is electromagnetic radiation (EMR) with longer wavelengths than those of visible light, and is therefore generally invisible to the human eye
3. Ultraviolet (UV) is electromagnetic radiation with a wavelength from 10 nm to 400 nm, shorter than that of visible light but longer than X-rays.
4. Various Rays (X-Rays, Gamma rays, Micro wave and Radio waves)

VISIBLE AND INVISIBLE LIGHT



NOTE: The greater the energy, the larger the frequency and the shorter the wavelength.

The importance of light

- 1- Source of energy for Photosynthesis.
- 2- Important in the process of transpiration, flowering, germinations and hormones formation.
- 3- Important factor in animal migration and animal reproduction.
- 4- Essential for eye sight and maintain body temperature for many animals.
- 5- Interferes with other factors such as heat and humidity which will effect structure of organisms.

Types of light measurement devices:

- **Solarimeter** a type of measuring device used to measure combined direct and diffuse solar radiation. An integrating solarimeter measures energy developed from solar radiation based on the absorption of heat by a black body.



Types of light measurement devices:

- **Radiometer** is a device for measuring the power of electromagnetic radiation. Generally, a radiometer is an infrared radiation detector or an ultraviolet detector
- The vanes rotate when exposed to light, with faster rotation for more intense light, providing a quantitative measurement of electromagnetic radiation intensity.



Types of light measurement devices:

• Photometer is an instrument that measures light intensity or the optical properties of solutions or surfaces. Photometers measure: (Illuminance, Irradiance, Light absorption, Scattering of light, Reflection of light and Fluorescence)



Types of light measurement devices:

- Secchi disc is a plain white, circular disk 30 cm (12 in) in diameter used to measure water transparency or turbidity in bodies of water. The disc is mounted on a pole or line, and lowered slowly down in the water. The depth at which the disk is no longer visible is taken as a measure of the transparency of the water. This measure is known as the Secchi depth and is related to water turbidity. Since its invention, the disk has also been used in a modified, smaller 20 cm (8 in) diameter, black and white design to measure freshwater transparency.

Types of light measurement devices:

