Science 8

4.3 Light and the Electromagnetic Spectrum

- Nothing in the universe is known to travel faster than light.
- It takes light only a few minutes to make the 150 000 000 km journey to Earth.

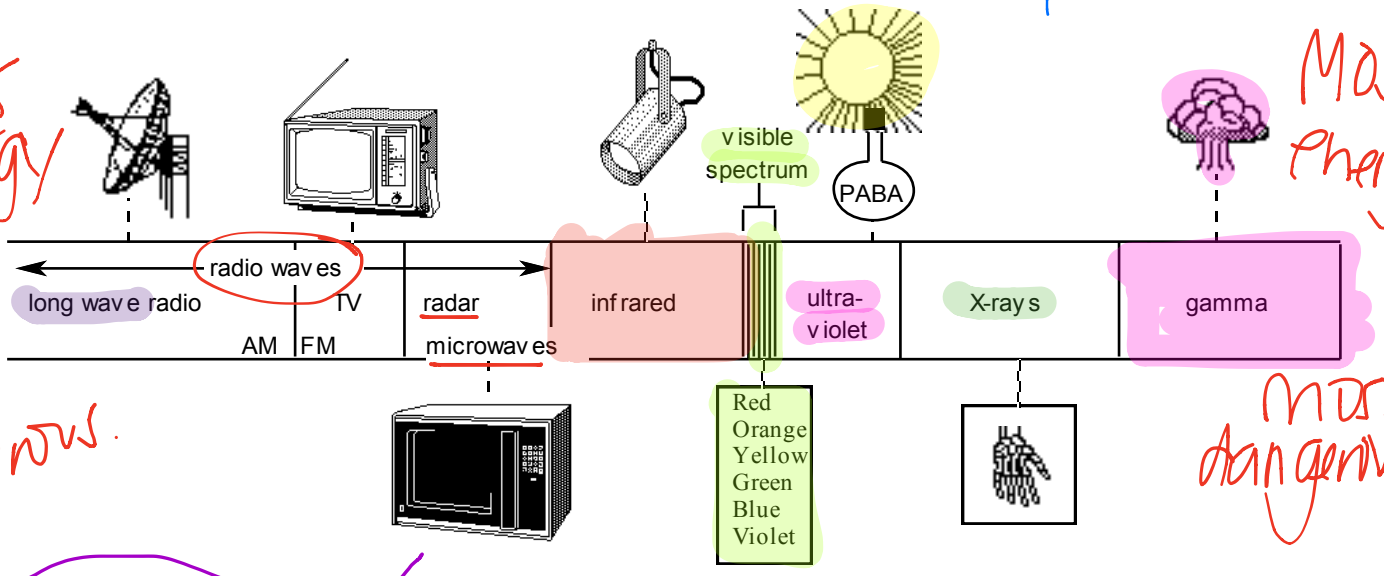
Other forms of solar radiation (radio waves, ultraviolet, infrared, gamma and X-rays) travel at the same speed as light: 300 000 km/sec.

- ROYGBIV

- The visible spectrum is only a very small part of a much broader band of radiations called the electromagnetic spectrum!!!

Less energy

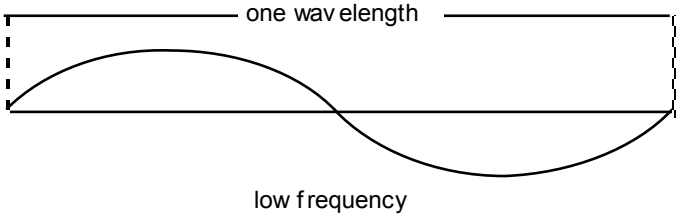
Most energy

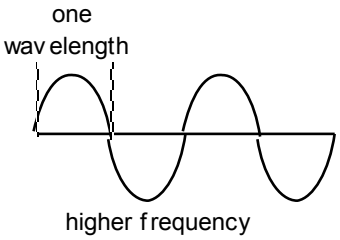


Less dangerous.

Most dangerous

A low frequency wave has a longer wavelength than a wave with a higher frequency.





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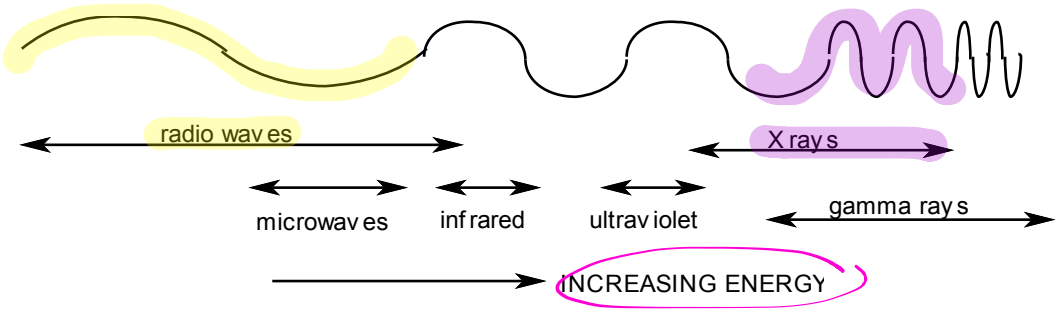
The energy of electromagnetic radiation is related to its frequency

- As the frequency of the electromagnetic radiation increases, so does its energy.
- Low-frequency radio waves have low energy, light waves have higher energy, and high-energy X-rays and gamma rays have the highest frequency.
  - For this reason, X-rays and gamma rays are hazardous to living things; the high energy of their electromagnetic radiation damages cells.

Spectrum



NOTE: Ultraviolet radiation is a form of light energy.

X-ray and gamma ray radiation are a form of nuclear energy.

Infrared radiation is a form of heat energy.

STOP Notes Here!

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→ complete spectrum worksheet.

Electromagnetic Radiation

Read pages 154-160 and take notes on the different types of electromagnetic radiation. Be sure to include at least ONE USE for each type!!!

Wavelengths longer than visible light

Radio waves

describe: - low energy
- low frequency, long wavelength

uses: microwave ovens

Microwaves

Infrared Waves

Wavelengths shorter than visible light

Ultraviolet Waves

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X Rays

Gamma Rays

- ❑ Read pages 152-161 in your textbook
- ❑ Do Pg. 163 #1-12 in your textbook

The Electromagnetic Spectrum and its Uses

Radiowaves –

Microwaves –

Infrared light –

Visible light –

Ultraviolet light –

X-Rays –

Gamma rays –

Cosmic rays –