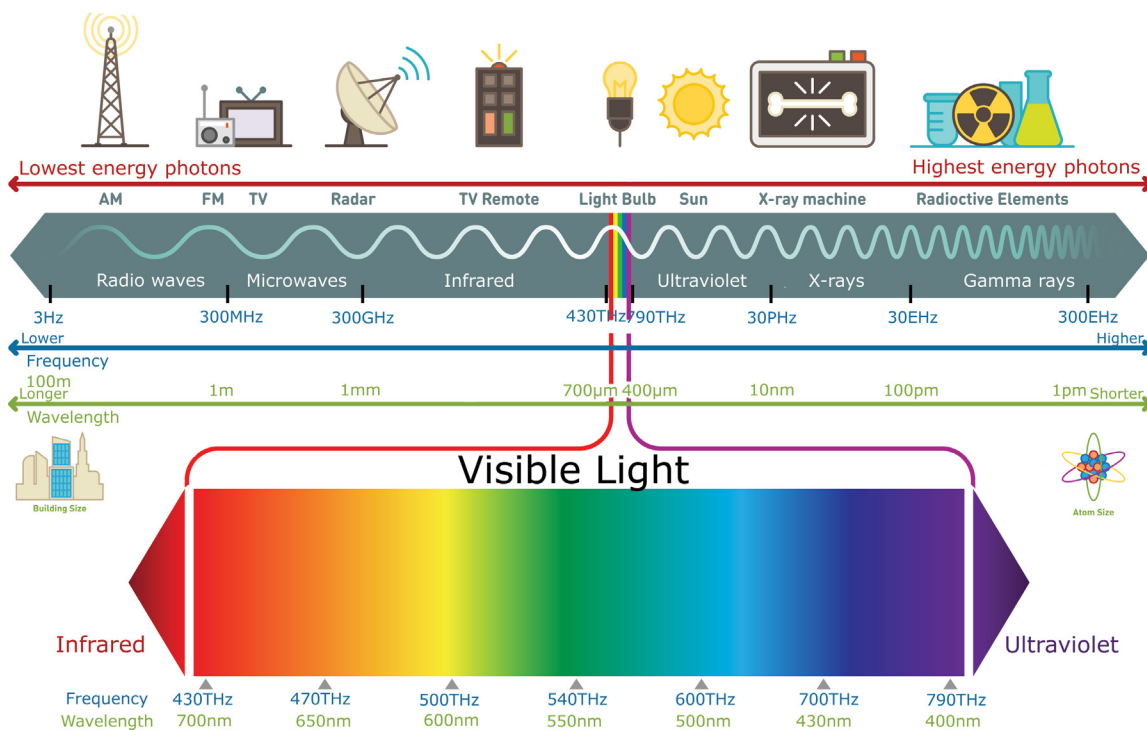


11.5 ELECTROMAGNETIC SPECTRUM

Since light is carried as an electromagnetic wave and is radiated (“given off” or “emitted”) from something, it is also called **electromagnetic radiation**. Electromagnetic radiation is any kind of emitted energy carried in the form of an electromagnetic wave. As you can see below, visible light makes up only a small portion of the wide range of electromagnetic radiation. We call this wide range the **electromagnetic spectrum**.



Note that there is a quite a bit of information in that graphic **above**, so please take time to study it and understand it. This will help a lot in your study of electromagnetic radiation and light. Here’s a brief summary of the important concepts related to this information:

1. There are many different objects that emit electromagnetic radiation. Some of them are shown at the top of the graphic (radio towers, microwaves, the sun, etc.).
2. Remember, electromagnetic radiation travels in the form of transverse waves, so it bears the features of them—frequency, amplitude, wavelength.
 - a. Each type of electromagnetic radiation has a unique wavelength and frequency, which, as you can see from the graphic, includes a wide range of frequencies and wavelengths—a “spectrum” (Isaac Newton was the first person to use the term “spectrum” to describe what we now call electromagnetic radiation).
 - i. Frequencies of the entire spectrum run from 3MHz (3,000,000, or 3×10^6 , Hz) to 30EHZ (30,000,000,000,000,000,000, or 3×10^{19} , Hz).
 1. Remember that frequency is the number of waves per second, so even “low frequency” electromagnetic radiation contains 3 million waves per second!
 - ii. Wavelengths run from 1pm (0.000000000001, or 10^{-12} meter) to more than 100,000km (100,000,000, or 1×10^8 , meter).