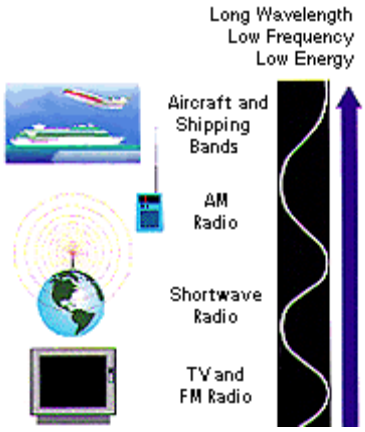
CLASS SET!!!!!!!!!!

Electromagnetic Spectrum

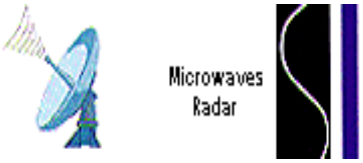
Measuring the electromagnetic spectrum

You actually know more about it than you may think! The electromagnetic (EM) spectrum is just a name that scientists give a bunch of types of radiation when they want to talk about them as a group. Radiation is energy that travels and spreads out as it goes-- visible light that comes from a lamp in your house and radio waves that come from a radio station are two types of electromagnetic radiation. Other examples of EM radiation are microwaves, infrared and ultraviolet light, X-rays and gamma-rays. Hotter, more energetic objects and events create higher energy radiation than cool objects. Only extremely hot objects or particles moving at very high velocities can create high-energy radiation like X-rays and gamma-rays.

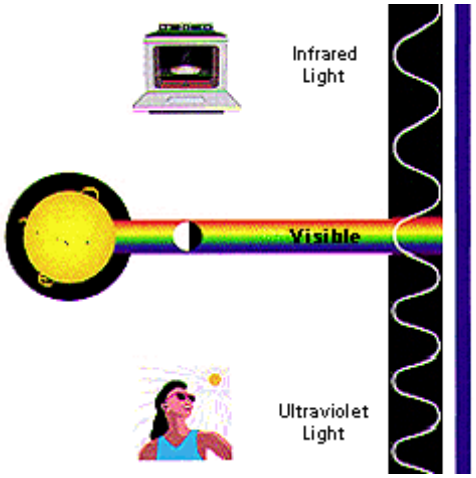
Here are the different types of radiation in the EM spectrum, in order from lowest energy to highest:



Radio: Yes, this is the same kind of energy that radio stations emit into the air for your boom box to capture and turn into your favorite Mozart, Madonna, or Justin Timberlake tunes. But radio waves are also emitted by other things ... such as stars and gases in space. You may not be able to dance to what these objects emit, but you can use it to learn what they are made of.



Microwaves: They will cook your popcorn in just a few minutes! Microwaves in space are used by astronomers to learn about the structure of nearby galaxies, and our own Milky Way!

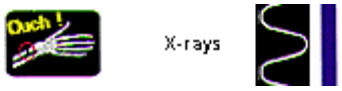


Infrared: Our skin emits infrared light, which is why we can be seen in the dark by someone using night vision goggles. In space, IR light maps the dust between stars.

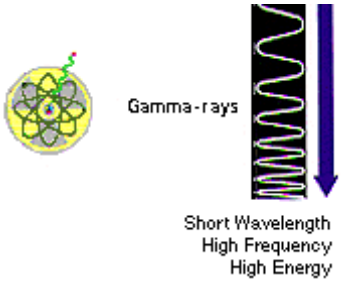
Visible: Yes, this is the part that our eyes see. Visible radiation is emitted by everything from fireflies to light bulbs to stars ... also by fast-moving particles hitting other particles.

Ultraviolet: We know that the Sun is a source of ultraviolet (or UV) radiation, because it is the UV rays that cause our skin to burn!

Stars and other "hot" objects in space emit UV radiation.



X-rays: Your doctor uses them to look at your bones and your dentist to look at your teeth. Hot gases in the Universe also emit X-rays .



Gamma-rays: Radioactive materials (some natural and others made by man in things like nuclear power plants) can emit gamma-rays. Big particle accelerators that scientists use to help them understand what matter is made of can sometimes generate gamma-rays. But the biggest gamma-ray generator of all is the Universe! It makes gamma radiation in all kinds of ways.

Directions: Following your teachers instructions, create a foldable about the different types of electromagnetic waves.

Each section of your foldable should have a drawing of the type of wavelength this wave has.

Each section of your foldable should answer the following 3 questions:

1. Describe the wavelength of this type of wave.
2. How is this type of wave useful in our daily lives on Earth?
3. How do Astronomers use this type of wave to study the universe?

The last section of your foldable should be a complete labeled drawing of the entire electromagnetic spectrum.