**Radio Waves**

For the last time turn that radio down!!!! How many times have you heard this in your life? Have you ever wondered where the name radio comes from? The name radio actually comes from the types of electromagnetic waves that are received by your antenna. The radio stations send out these radio waves through the air and are picked up by your antenna. The waves are transferred to the inside of the radio and they are then transferred in to sound energy wave that are picked up by your ears.

Radio waves have the longest wavelength on the electromagnetic spectrum. This means they carry less energy than other EM waves.

**Where can they be found?**

* Radio
* MRI devices in hospitals: These devices send off a radio wave that is received by a huge magnet and enable doctors to look inside the human body at soft tissues
* Stars and gases in space let off these waves
* TV’s use radio waves to receive reception the same way radio waves use them
* Direct TV and Dish Network dishes uses “the dish” to collect radio waves from satellites in space.

**Microwaves**

Are you in a hurry in the morning and no time to cook? Well the electromagnetic spectrum has the answer to your worries. Look in the cabinet, grab out a Pop Tart and pop it in the Microwave Oven for 30 seconds! Breakfast is served. Have you ever wondered why we call these things microwave ovens? Its really quite simple. The oven emits microwaves that transfer its energy in to heat energy to warm up the food. This use is a common application of microwaves but there are more. Microwave have a shorter wavelength than Radio but a longer one than Infrared.

**Where are they found?**

* Microwaves
* Some cell phones send and receive microwaves to transfer your sound energy
* Some satellite dishes also use microwaves
* Used in radar to forecast weather (Doppler radar)

**Infrared Waves**

Have you ever wished you could see people in the dark? Have you ever seen night vision goggles? These are made possible by Infrared Waves. Our skin emits infrared waves and night vision goggles enable our eye to see these waves. Pretty neat! Infrared wavelengths fall between Microwaves and the Visible Light waves.

Where are they found?

* Heat lamps in restaurants let off infrared waves. These waves hit the food (i.e. French fries) to keep them warm until served
* Remote controls use infrared waves to send to your TV to change the channel or volume
* Used by NASA to map the dust between stars
* Plant life reflect infrared waves reflect short infrared waves

**Visible Light Waves**

Do you know ROY G BIV? He’s a really colorful guy! Yes he is that guy that helps us remember the colors of the visible light spectrum. Visible light waves are quite unique because it is the small frequency that the cones and rods in our eyes can see!! This small portion of the electromagnetic spectrum allows us to see the world! There are a few light sources and from these light sources the things we see reflect this light and our eyes receive these signals.

When all color wavelengths are received by the eye, the eye perceives white light. The closest wavelengths to visible light waves are Infrared and Ultraviolet.

**Where are they found?**

* The sun
* Light bulbs
* Fireflies
* Stars
* Computer monitors

Be careful: The moon reflects light wave from the sun. It is not a light source. The same is true with a projector in the classroom. The projector is the light source and the screen reflects this light to your eyes.

**Ultraviolet Waves**

Summer is hot and without sunscreen you could get burned! Blame it on the electromagnetic spectrum. Ultraviolet waves (UV rays) are responsible for all of your sunburns. Luckily the Ozone layer along with other gases absorb most of these rays allowing us to inhabit planet earth. Sunscreen is a chemical that blocks some of these UV rays from damaging the cell in the skin. UV waves fall between Visible Light waves and X-rays in their frequency level.

**Where are they found?**

* The sun
* Tanning Beds
* Stars emit UV rays
* Astronomers observe the amount of UV radiation that is given off by stars and planets

**X-ray Waves**

X-ray vision would be a really cool super power. Luckily for many patients doctors now have this power. The concept is pretty simple. A machine sends x-rays through a human body. The bones and hard matter in the body stop the waves while the soft tissue and liquids allow them to pass through. On the other side of the patient is a receiver to pick up the waves and determine which waves made it and which did not. Doctors can see small breaks in bones because the small crack would fill up with liquid and allow the X-ray to pass through. X-rays have the next to last highest frequency on the electromagnetic spectrum.

**Where are they found?**

* X-ray machines in hospitals
* Used at security checkpoints in airports to check for hidden devices in passenger’s clothing.

**Gamma Waves**

Could you imagine that the same waves used in nuclear explosions can also be used as a cancer treatment? Remember that gamma waves carry the most energy on the electromagnetic spectrum. Exposure to gamma rays kill and/or cause mutations in cells. These mutations can lead to cancer in patients. Researchers have found that these waves will also kill cancer cells. They sometimes treat specific tumors with gamma rays (radiation) to kill the cancer cells. These waves have the shortest wavelengths on the electromagnetic spectrum.

**Where can they be found?**

* Used for cancer treatment
* Generated in radioactive atoms
* Nuclear Explosions
* Nuclear Power Plants
* Nuclear explosions in stars