**The Electromagnetic Spectrum (EM spectrum)**

All of us are surrounded by invisible waves travelling around and through us. All wireless communication and many of our technological devices use **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_**, which is also known as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. The type of EM radiation we are most familiar with is **\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_**.

All EM radiation is the movement of **\_\_\_\_\_\_\_\_\_** particles called **\_\_\_\_\_\_\_\_\_**. Different types of **\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_** are light moving with different **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**A Chart of the EM Spectrum**



**Radio waves**

* These waves have the longest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and lowest \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ compared to the other waves.
* They are often used for broadcasting \_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_.
* In the medical field a magnetic resonance imaging (\_\_\_\_\_) machine will magnetically line up small particles in bone and tissue then suddenly change the orientation of those particles. When the particles move they release energy in the form of \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_, which are read by the MRI machine to make a map of the tissues.

**Microwaves**

* These waves are slightly \_\_\_\_\_\_\_\_\_\_ than radio waves and have more \_\_\_\_\_\_\_\_\_\_.
* The energy from microwave radiation is very easily absorbed by \_\_\_\_\_\_\_\_.
* A microwave in your house will send microwaves at food and the \_\_\_\_\_\_\_\_\_\_ in the food will absorb the energy and heat up. Microwaves don’t work well on food without any \_\_\_\_\_\_\_\_\_ in it.
* Microwaves are also used as \_\_\_\_\_\_\_\_\_\_\_\_. The waves are sent out, will bounce off an object, and be received from the same place they were sent. The time it takes for the radar to go out and come back is used to determine how away the object is.

**Infrared waves**

* Infrared is the most common wave used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technologies like remotes and reading CD’s or Blue Ray Discs.
* \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ also uses infrared waves, as warm object will emit more infrared than cold objects.

**Visible Light**

* This very short section of light waves are the only ones we can see with our eyes. Our eyes formed to specifically only recognize the light waves that travel through water the best. NEAT!

**Ultraviolet**

* Ultraviolet waves have a slightly \_\_\_\_\_\_\_\_\_\_\_\_ wavelength and have more \_\_\_\_\_\_\_\_\_\_\_ than visible light.
* Ultraviolet radiation enables your body to process \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_, but over exposure can result in \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**X Rays**

* X rays have a much shorter wavelength and higher energy than visible light.
* X rays can pass through \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ easily but will bounce off \_\_\_\_\_\_\_\_\_.
* This allows doctors to take pictures of your \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ without having to cut you open.
* Since the X rays have \_\_\_\_\_ \_\_\_\_\_\_\_\_\_, too much of them can be harmful.

**Gamma Rays**

* Gamma rays are the \_\_\_\_\_\_\_\_\_\_\_ energy, \_\_\_\_\_\_\_\_\_\_\_\_ wavelength type of EM waves.
* These high energy waves mostly come from the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ happening in \_\_\_\_\_\_\_\_\_.
* We have recently been able to used highly \_\_\_\_\_\_\_\_\_\_\_\_\_ beams of gamma rays to kill sections of \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ in the body.

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