



Today we are going to talk about light energy and waves. This is a fun lesson because we have some science toys we get to use as we learn about light.


**Waves have the ability to transfer energy from one point to another**



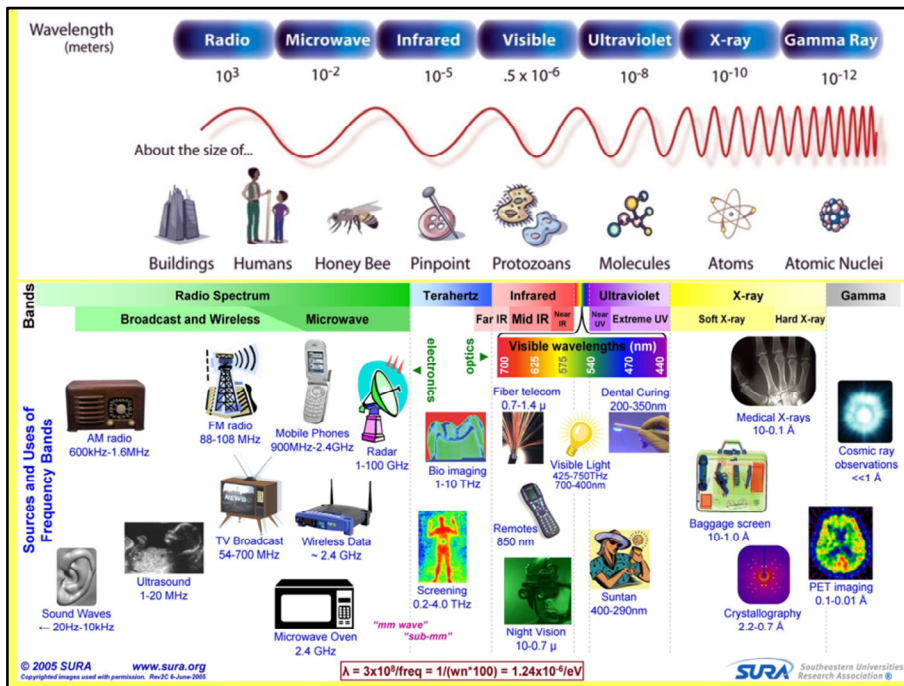
Ask if they agree or disagree with this statement; slinky demonstration showing 2 different waves; Light travels in TRANSVERSE waves just like the ocean and the wave done at sports events (sound travels in compression waves)

# RMIVUXG

## Electromagnetic Spectrum

- Radio
- Micro
- Infrared
- Visible 
- Ultraviolet
- X-ray
- Gamma

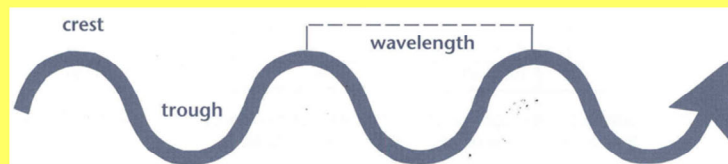
RMIVUXG – Rabbits Meet In Very Unusually Expensive Gardens (this is a way to remember the Electromagnetic Spectrum in order; All light travels from the sun in waves (TRANSVERSE Waves) Tell them today we're focusing more on the visible light part of the spectrum



A picture of the spectrum to show the relative heights of the wave lengths and common uses of each wavelength

## UNDERSTANDING WAVELENGTH

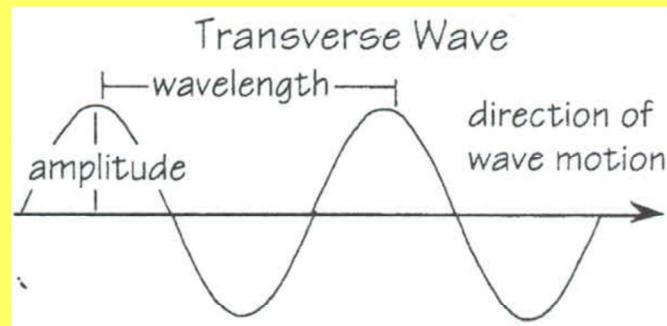
- In a transverse wave, the wavelength is typically measured from crest to crest
- The shorter the wavelength, the more energy the wave has



No we will go over important properties of waves; read slide and discuss

## UNDERSTANDING AMPLITUDE

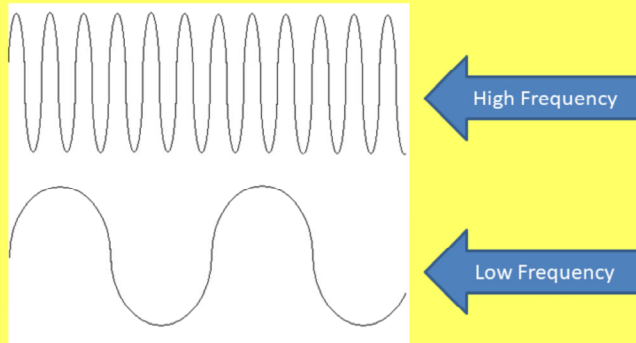
- The measure of height of wave above its equilibrium position



Read slide and discuss

## UNDERSTANDING FREQUENCY

- How often a wave vibrates
- One vibration per second is called a hertz, the unit of measure for frequency



Read slide and discuss

# What is a Spectroscope?

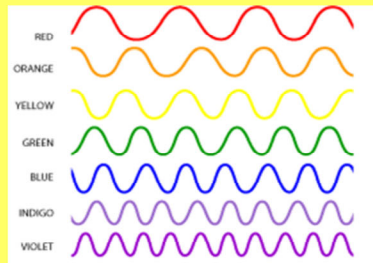
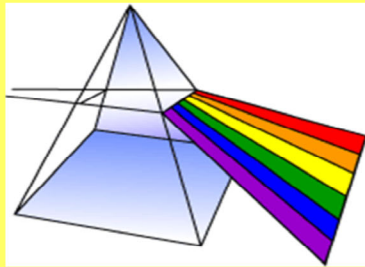


Pass around the spectroscopes, ask the kids to look around but not talk about what they see. Once everyone has had a chance to look through it then pass around the glasses. After everyone has looked, then discuss what they saw. Explain that spectroscope is made of two words, spectro which is the light spectrum and scope which is to view or see. So these items help us to see the visible light spectrum, which is the rainbow of colors. The lens in the spectroscope bends the visible light waves so that we can see the colors.



## VISIBLE LIGHT

- All the energy we get from the sun travels in waves. Some of that energy is in light waves we can see- *visible light*
- Visible light is made of many colors. Every color has a different wavelength

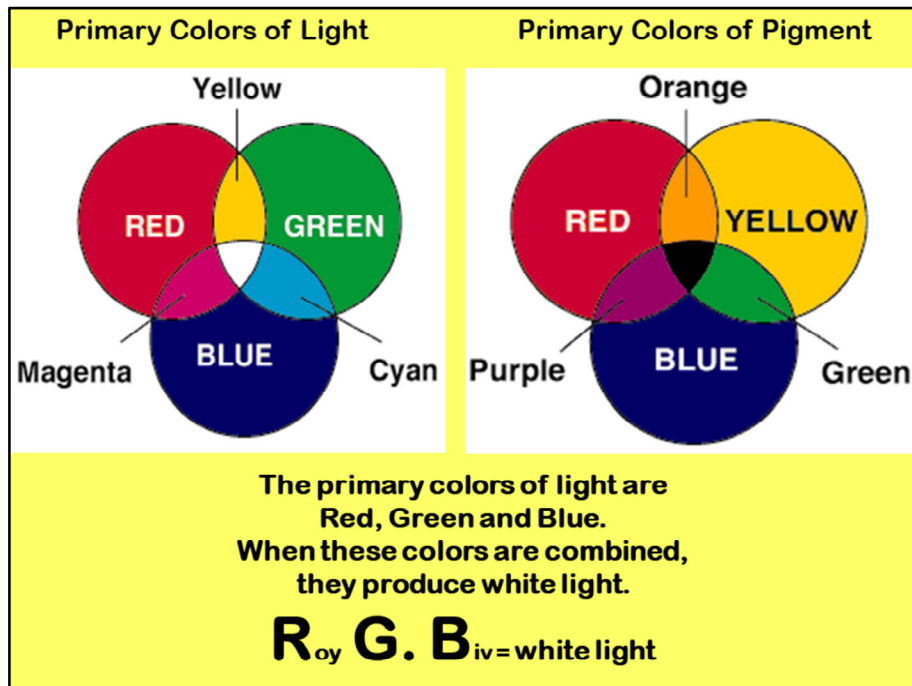


*COLORS OF THE LIGHT SPECTRUM (Roy G. Biv)*

# Spinning Colors



This is where you will use the spinning color wheel. Ask the kids to be quiet as you spin it and then ask for their observations. Usually most kids will see orange and blue colors first, but its hard to see all the colors because it is moving too fast for our brains to keep up.

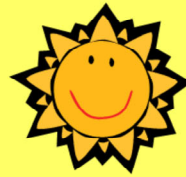


Discuss differences between light and pigment

# Can Light Do Work?

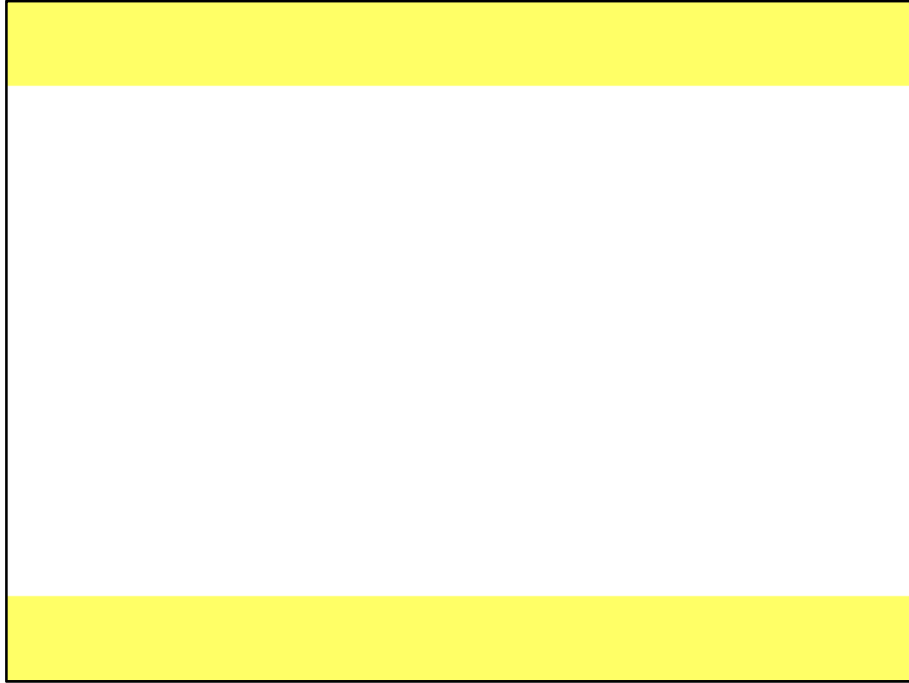


**PV Cells**



**Radiometers**

Show them the Radiometer, it works by capturing the light waves they bounce off the white and are absorbed by the black; the PV (photovoltaic) cells are solar panels, hook up the fan to the panel and if there's enough sunlight it will spin



Solar panel video Georgia Walton EMC



Review key terms and see if youth have any questions