

Electromagnetic Spectrum Notes

What is a wave?

- What are 2 types of waves? _____
- A _____ is any disturbance that _____
_____ through matter or space.

Where does the energy go?

- Energy is carried _____ from its source by a _____.
- The material _____
_____ with the wave.
 - Example: A boat in the ocean doesn't travel as the wave flows all the way to the beach



Energy Transfer Through a Medium

- Some waves transfer energy through a medium. A medium can be a _____, a _____, or a _____.
- Energy is transferred from the 1st particle to the 2nd, to the 3rd, to the 4th...
- Examples of waves that travel through a medium are _____ waves, _____ waves, and _____ waves.

Energy Transfer Without a Medium

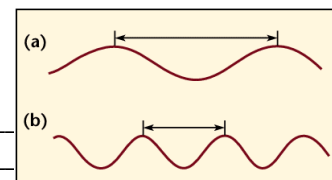
- Some waves can transfer energy _____ traveling through a medium.
- Examples: _____, Micro- waves, _____, & X rays.
- Waves that do not require a medium are called _____ waves, or _____.
- Even though they do not require a medium, they can still travel through stuff, but are fastest through _____ space.

Electromagnetic Waves

- In space, the speed of light (EM waves) is about 300,000,000 m/s.
- All EM waves are about the same, but scientists use _____ characteristics to classify them: _____ and _____.

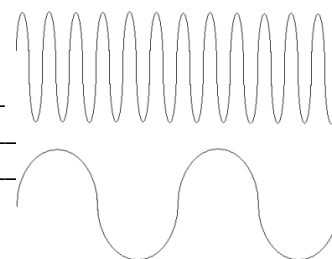
Wavelength

- WAVELENGTH: _____



Frequency

- FREQUENCY: _____



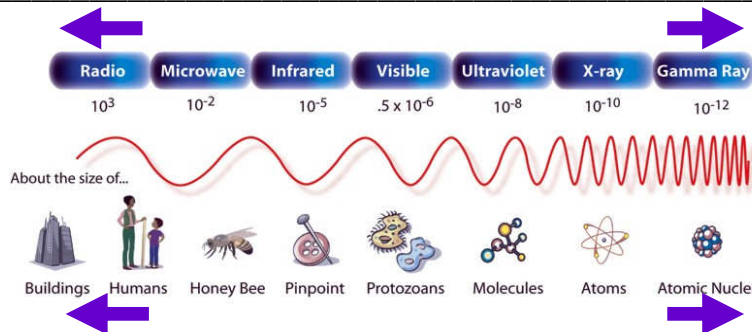
- = How often something happens

How much energy is in there?

- To find out the amount of _____ carried by a wave, refer to the _____ and _____.
- Hint: If it is very "squiggly" it has more energy

The EM Spectrum

- The entire range of EM waves is called the _____ spectrum.
- It is _____ from _____ to _____ wavelength, and from _____ to _____ frequency.



Visible Light

- It is the _____ of the EM _____ that we can _____.
- We see _____ as _____.

Who is Roy G. Biv?

- The range of colors that makes up visible light is called the visible spectrum.
- To remember the order of the colors you can use the acronym "Roy G. Biv"

R=	O=	Y=
	G=	
B=	I=	V=

White Light

- When all the _____ of visible light are _____, you see the light as _____ light.
- _____ and light from _____ and fluorescent light bulbs are examples of _____ light

Ultraviolet Light

- _____ light is the category of electromagnetic waves just _____ visible light.
- _____% of the energy from the _____ is ultraviolet
- These waves have _____ than visible light therefore affect us in good and bad ways.

Electromagnetic Spectrum Notes

What is a wave?

- What are 2 types of waves? radio waves, ultraviolet waves, Infrared waves, Microwaves, ocean waves, seismic waves, sound waves, light waves
- A wave is any disturbance that transmits energy through matter or space.

Where does the energy go?

- Energy is carried away from its source by a wave.
- The material doesn't move with the wave.
 - Example: A boat in the ocean doesn't travel as the wave flows all the way to the beach



Energy Transfer Through a Medium

- Some waves transfer energy through the vibration of the particles in a medium. A medium can be a solid, a liquid, or a gas.
- Energy is transferred from the 1st particle to the 2nd, to the 3rd, to the 4th..
- Examples of waves that travel through a medium are water waves, sound waves, and seismic waves.

Energy Transfer Without a Medium

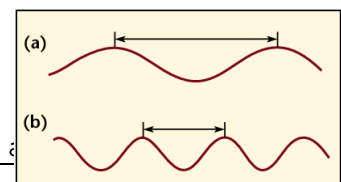
- Some waves can transfer energy without traveling through a medium.
- Visible light does not require a medium; either do microwaves, radio waves, and X rays.
- Waves that do not require a medium are called electromagnetic waves, or EM waves.
- Even though they do not require a medium, they can still travel through air, water and glass, but are fastest through empty space.

Electromagnetic Waves

- In space, the speed of light (EM waves) is about 300,000,000 m/s.
- All EM waves are about the same, but scientists use ___ characteristics to classify them: WAVELENGTH and FREQUENCY

Wavelength

- WAVELENGTH: the distance between one point on a wave and the next corresponding point on the next wave.



Frequency

- FREQUENCY: the number of waves produced in a given amount of time.
- = How often something happens

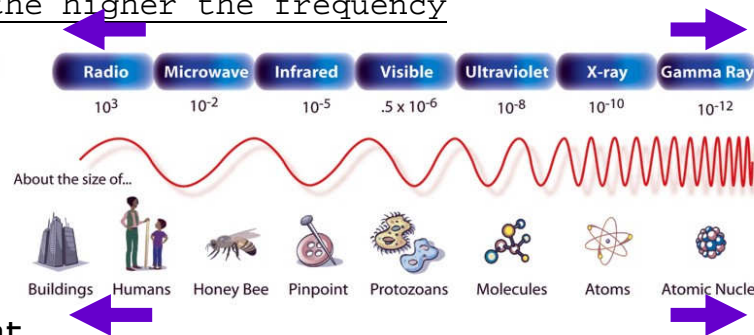
How much energy is in there?

- To find out the amount of energy carried by a wave, refer to the wavelength and frequency.
- Waves with short wavelengths and high frequencies carry more energy than waves with long wavelengths and low frequencies
- Hint: If it is very "squiggly" it has more energy

The EM Spectrum

- The entire range of EM waves is called the electromagnetic spectrum.
- It is arranged from long to short wavelengths, and from low to high frequency.

The longer the wavelength the lower the frequency, the shorter the wavelength the higher the frequency



Visible Light

- It is the range of the EM spectrum that we can see.
- We see different wavelengths as different colors.
- The longest wavelength we see is red light, and the shortest is violet light.
- Violet light has the shortest wavelength, so it carries the most energy.

Who is Roy G. Biv?

- The range of colors that makes up visible light is called the visible spectrum.
- To remember the order of the colors you can use the acronym "Roy G. Biv"

R=red

O=orange

Y=yellow

G=green

B=blue

I=indigo

V=violet

White Light

- When all the colors of visible light are combined, you see the light as white light.
- Sunlight and light from light bulbs and fluorescent light bulbs

are examples of white light.

Ultraviolet Light

- Ultraviolet light is the category of electromagnetic waves just beyond visible light.

- 10% of the energy from the sun is ultraviolet

These waves have more energy than visible light therefore affect us in good and bad ways.