Green Team Science - Mrs. Ferdinand

Date: May 15, 2018

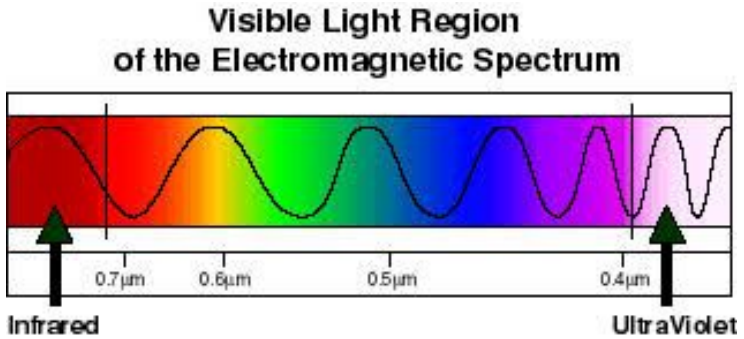
Homework: Waves Study Guide: start reviewing NOW

Reminders: Unit Test: Friday, May 18
Unit Test Review: Thursday

Turn In
Activity 9: Wave Refraction

Challenge Question
None

Agenda / Activity
Unit: WAVES
Activity 10: Comparing Colors



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Activity 10: Comparing Colors

Exposure to the sun can damage our eyes.

White light is colorless light (like daylight).

White light can be separated into the ***visible light spectrum*** which are the *colors of the rainbow*. (ROYGBIV)

How are rainbows formed?

Is this an example of reflection or refraction?

Demo: Diffraction Grating (white light being spread out as it passes through very fine slits

All the colors in the visible light spectrum have different wavelengths and different frequencies. White light is refracted based on the frequencies of different colors

Why do you see color?

When you look at an object, ***the wavelength of the color that is reflected is the color that you see***. All the other colors are ***absorbed***.

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The Colors of the Visible Light Spectrum

COLOR	WAVELENGTH INTERVAL	FREQUENCY INTERVAL
RED	~ 700 - 635 nm	~ 430 - 480 THz
ORANGE	~ 635 - 590 nm	~ 480 - 510 THz
YELLOW	~ 590 - 560 nm	~ 510 - 540 THz
GREEN	~ 560 - 520 nm	~ 540 - 580 THz
CYAN	~ 520 - 490 nm	~ 580 - 610 THz
BLUE	~ 490 - 450 nm	~ 610 - 670 THz
VIOLET	~ 450 - 400 nm	~ 670 - 750 THz

Different colors of light have different frequencies, which causes them to travel at different speeds when they move through matter

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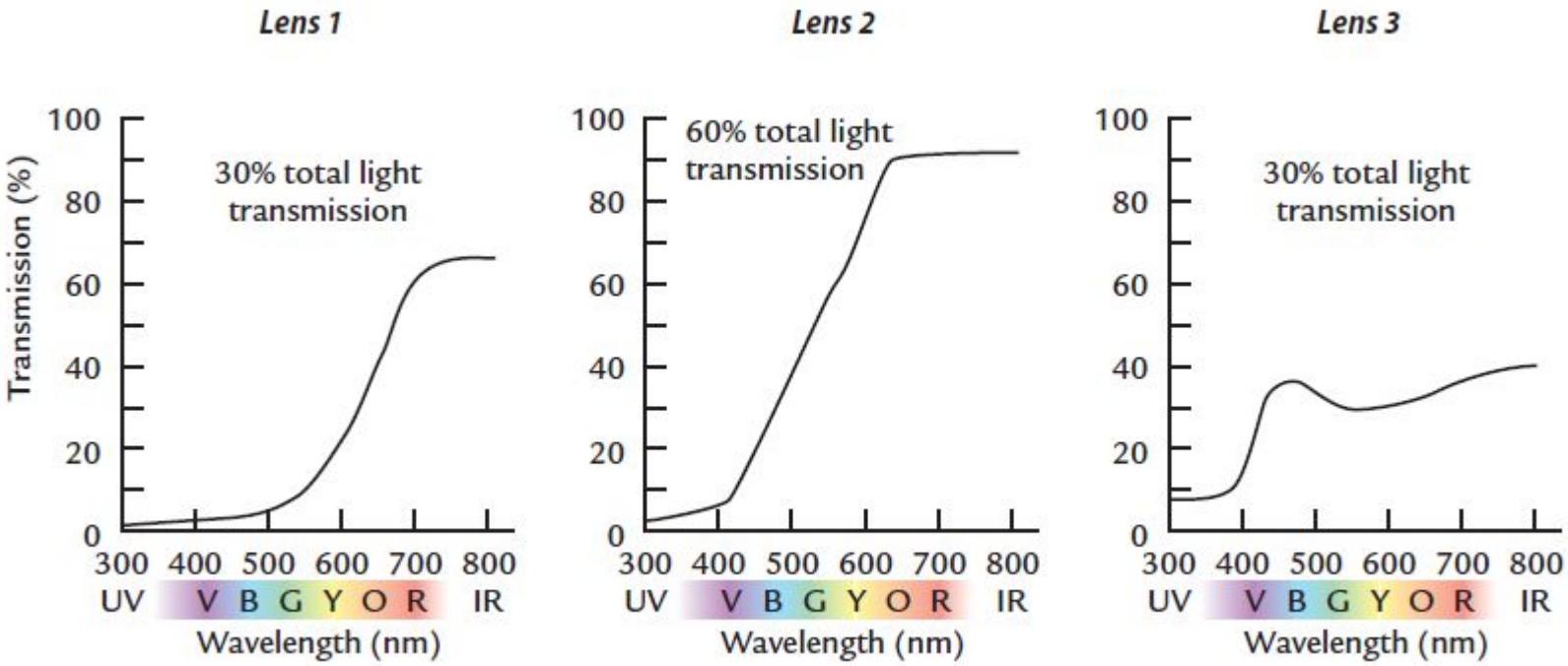
Activity 10: Comparing Colors

Transmission Graphs (wavelength vs. transmission percentage)



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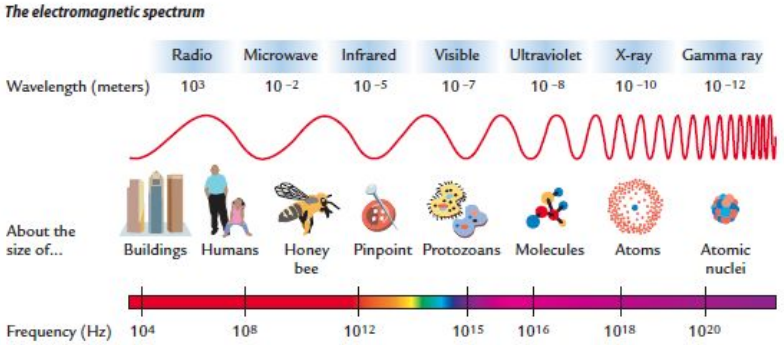

Turn In
None

Challenge Question
None

Agenda / Activity
Unit: WAVES
Activity 11 & 12: Selective Transmission / Electromagnetic Spectrum

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Comparing Colors Lab

In ascending order, the colors are red, orange, yellow, green, blue and violet.

- this is always the order of the visible light spectrum
- the colors blend from one to the next. No distinct boundary.

Each color has a different frequency and wavelength.

- **Frequencies increase from red >>> violet**

How Does the Colored-Film Card work?

Each colored film isolates a single color of light.

- the film allows only 1 color to be transmitted through the film and come out the other side.

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Comparing Colors Lab

What should you have observed with the Colored-Film Card ?

- **Violet was the brightest, then blue.**
- The other colors should not have triggered a response of the strip in the Phoso-box.

Why didn't all the colors make the strip glow?

- All colors of light carry energy, but each color carries a different amount
- Remember each color is a wave with a different frequency
- Only the violet and blue had enough energy to to make the strip glow. (higher frequency)

For visible light, violet has the highest frequency and red has the lowest frequency.

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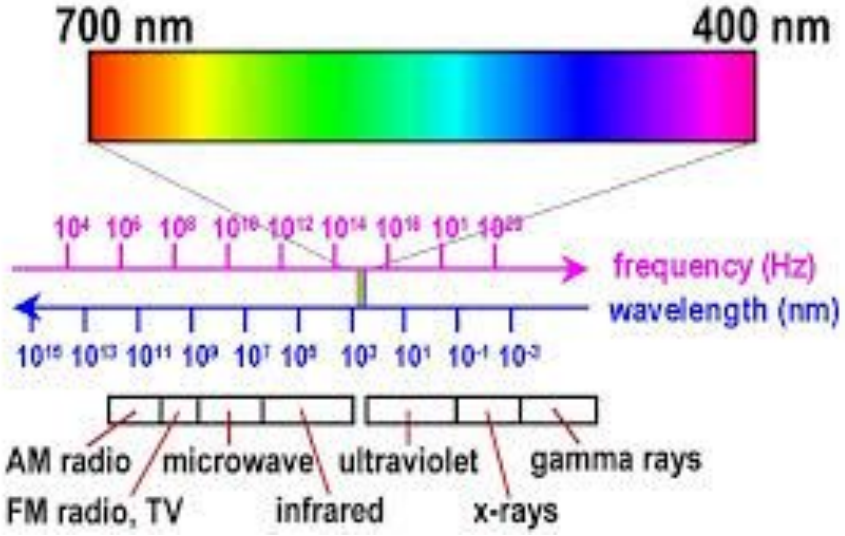
[Comparing Colors Lab]

Based on what you just heard ,what is the relationship between color and frequency?

Which color light is more likely to damage eyes due to its higher energy?



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Activity 11: Selective Transmission

Sunlight is made up of different waves on the electromagnetic spectrum with many different wavelengths (visible light, infrared light and ultraviolet light)

When light hits an object, it is reflected, transmitted or absorbed by the object that it hits.

Light waves are reflected when light bounces off an object and is either sent in one direction or scattered in many directions

Light waves are absorbed when light enters an object and does not exit the object again as light.

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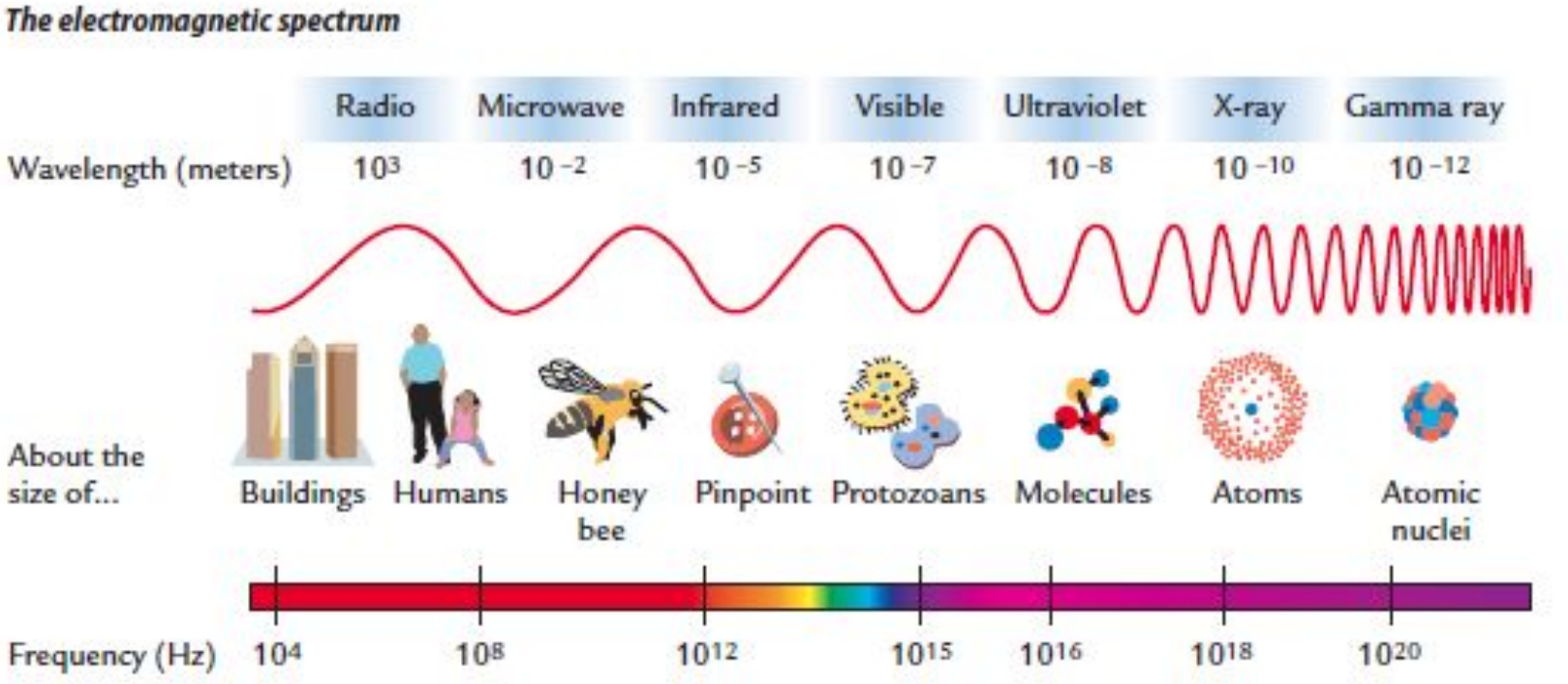

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Activity 12: The Electromagnetic Spectrum

Electromagnetic waves do not require a medium to travel through. They can travel through a vacuum.

The **electromagnetic** spectrum describes the range of **electromagnetic waves** placed in order of increasing frequency.

Infrared light: invisible light which is located before visible light on the electromagnetic spectrum

Infrared heats up objects more than visible light because of its wavelength.

UV Light is invisible light which is located after visible light on the electromagnetic spectrum

Most of the energy that reaches the Earth is in the form of infrared, visible and ultraviolet waves.

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Activity 13: Where Does The Light Go

(Below pertains to the lab for this activity)

Black objects absorb all wavelengths of light and converts them into heat, so the object gets warm.

White objects reflect all wavelengths of light. So the light is not converted into heat and the temperature of the object does not increase noticeably.

Aluminium foil is shiny and tends to reflect sunlight.