

Name _____

Light PowerPoint Notes

F. Y. I.

- Light is different from other kinds of waves. Other kinds of waves, such as sound waves must travel through matter. Light waves do not need to travel through matter. However, light waves can go through matter, such as air, water, and glass.

White Light

You get white light by combining all colors of light!

You can get light that appears white by adding just three colors of light together: **red**, **blue**, and **green**... “**The Primary Colors of Light**”

Combining colors of light is called **color addition**.

When two primary colors of light are added together, you see **secondary colors** of light.

Blue + Green = Cyan

Blue + Red = Magenta

Red + Green = Yellow

What’s going on?

- Imagine you and a friend are at a lake. Your friend wades into the water. You look at her, and her feet appear to have separated from her legs!!! You know her feet did not fall off. How do you explain this? It has to do with refraction!

Answer:

- In the case of your friend and her “detached” feet, the light wave was bent as it passed from the air (a gas) to the water (a liquid). Whew!!!

F. Y. I.

- White light is composed of all the wavelengths of visible light. Humans see the different wavelengths as different colors. White light can be separated into different colors during refraction. Color separation by refraction is responsible for the formation of rainbows. Rainbows are created when sunlight is refracted by water droplets!

Prisms produce rainbows through refraction. Light passing through a prism is refracted twice – once when it enters and once when it leaves.

F. Y. I.

- The wavelength of light is very small (100 times thinner than a human hair).
- Since light waves are so thin, they cannot diffract very much around large obstacles. Thus, you cannot see around corners.
- You can observe light waves diffracting if you examine the edges of a shadow. Diffraction causes the edges of a shadow to be blurry.

Material that absorbs light is **opaque**

Question:

Why is the sky blue?

Answer:

- As light moves through the atmosphere, most of the longer wavelengths, such as red, orange, and yellow pass straight through.
- However, much of the shorter wavelength light is absorbed by the gas molecules in the air. The absorbed blue light is then radiated in different directions. It gets scattered all around the sky. Whichever direction you look, some of this scattered blue light reaches you. Since you see the blue light from everywhere overhead, the sky looks blue.

Scattering explains why light becomes weaker with distance. Blue has a very short wavelength and scatters more than any other color.

Question:

- If violet has the shortest wavelength, why isn't the sky violet?

Answer:

- There are two reasons why the sky is not violet!
 1. There is not enough violet in visible light.
 2. The wavelength is too short.

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Blue + Green = _____

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