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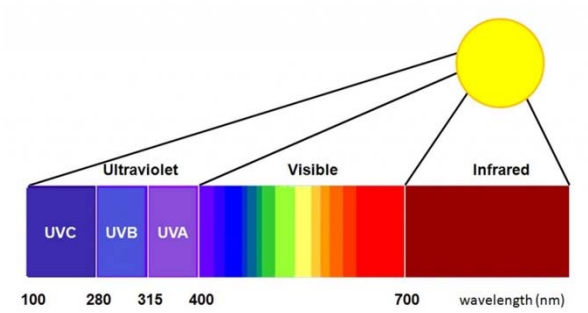
Colors of Light: Wavelengths and Frequencies Unveiled



Have you ever wondered why different colors of light appear the way they do? It's all about the fascinating relationship between wavelength and frequency. In this exciting journey, we'll delve into the world of colors of light and uncover the secrets behind their beautiful diversity.

Wavelength and Frequency

To understand the colors of light, we need to explore two essential properties: wavelength and frequency. Wavelength refers to the distance between two consecutive peaks or troughs of a light wave. It's measured in units like meters, nanometers, or angstroms (Å). Frequency, on the other hand, is the number of wave cycles that pass a point in one second. It's typically measured in hertz (Hz), where one hertz equals one wave cycle per second.

The Color Spectrum

When we observe light, we're often witnessing a mixture of different colors. This can be seen most vividly in a rainbow, where sunlight splits into a spectrum of colors, from red to violet. Each color corresponds to a different wavelength and frequency. Red light has the longest wavelength and the lowest frequency, while violet light has the shortest wavelength and the highest frequency.

Red Light

Red light has a wavelength of approximately 620-750 nanometers and a frequency of around 400-484 terahertz (THz). It's the first color you see in a rainbow and is known for its warm and calming appearance. Red is often associated with love, passion, and energy. It's also used in traffic signals to indicate "stop."

Orange Light

The wavelength of orange light falls in the range of about 590-620 nanometers, with a frequency of approximately 484-510 terahertz. Orange is a vibrant and energetic color, often linked to enthusiasm and creativity. It's the color of pumpkins and many delicious fruits.

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Yellow Light

Yellow light has a wavelength of around 570-590 nanometers and a frequency of about 510-526 terahertz. It's a bright and cheerful color, often associated with happiness and optimism. Yellow is the color of sunshine and ripe bananas.

Green Light

With a wavelength of about 520-570 nanometers and a frequency of approximately 526-576 terahertz, green light is fresh and soothing. It's the color of lush grass, leaves, and many plants. Green is often connected to nature, growth, and harmony.

Blue Light

Blue light falls in the range of 450-520 nanometers for wavelength and about 576-645 terahertz for frequency. Blue is a cool and calming color, often linked to tranquility and serenity. It's the color of the sky on a clear day and many bodies of water.

Indigo Light

Indigo light has a wavelength of about 435-450 nanometers and a frequency of around 645-690 terahertz. It's a deeper shade of blue and is often associated with intuition and spirituality. Indigo is not as commonly found in everyday objects as some other colors.

Violet Light

Violet light has the shortest wavelength in the visible spectrum, approximately 380-435 nanometers, and a frequency of about 690-790 terahertz. It's a vibrant and mysterious color, often connected to creativity and imagination. Violet is the color of some beautiful flowers, like violets and lavender.

White Light

White light is a mixture of all the colors in the visible spectrum. When you combine all the colors of light, they form white light. This can be observed when you shine sunlight through a prism, which splits it into a spectrum of colors.