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LED Array
#LEDARAY-01

Warning:

- **Not a toy; use only in a laboratory or educational setting.**
- **Choking Hazard- small parts**
- **California Proposition 65 Warning: This product can expose you to chemicals including lead, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to www.P65Warnings.ca.gov.**

Introduction

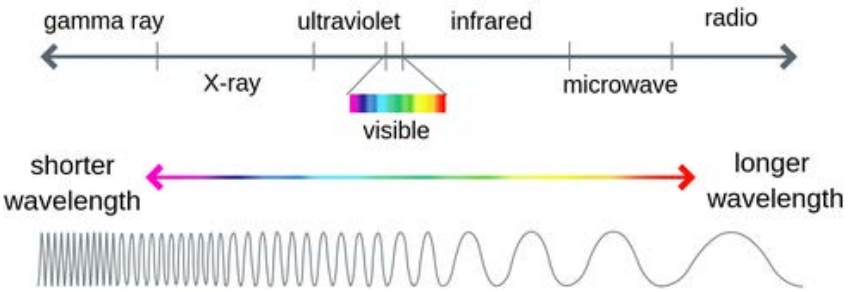
The LED Array demonstrates wavelengths of light much better than traditional white light with color filters. This unit has 9 different visible colors of light wavelengths and a white LED to show that all the colors are present in the white light. A dial knob is used to switch between each individual LED light or you may select all 10 lights on simultaneously.

This product makes it easy to explore the electromagnetic spectrum and properties of light by demonstrating different wavelengths even from a student's seat.

Explaining the Science

Below you will see an image of the electromagnetic spectrum. Light is made up of different wavelengths and each wavelength is a specific color. A wavelength is the distance between wave crests and is connected to frequency. Humans can only see a fraction of wavelengths. The visible spectrum for humans is between ultraviolet light and infrared light.

The wavelengths of white light can become visible by using a dispersive medium such as a prism or diffraction grating. This makes the different colors of the visible spectrum separate and create and image resembling a rainbow.



Demonstration

1. Place your LED Array on a flat surface facing a wall. Tape a piece of white paper on the wall to make seeing the colors easier, making sure it is lined up with the LED Array.
2. Turn off all the lights in the room.
3. Turn the dial on the LED Array to show all 10 colors. What do you notice?
4. Next place pieces of black tape over all of the colors except blue and yellow. Notice how blue and yellow is visible on the paper at both ends, however, towards the middle you begin to see green.
5. Repeat this process with other colors to demonstrate the visible color spectrum.

Discussion

During step 4 of the demonstration you should have observed a rainbow effect on the paper. As you looked towards the center of the paper, you noticed the color turned white. This is because white light is a combination of all visible colors in the electromagnetic spectrum. During step 5 of the demonstration you noticed how allowing only the blue and yellow lights to shine through created green in the middle. This is because green is in between blue and yellow on the color spectrum.