CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36420

Project Title

Glow with the Flow

Abstract

Objectives/Goals

The objective of this experiment is to determine if narrower bands of the light spectrum excite a luminescent plastic star to different degrees, thus causing the star to glow for different periods of time. Specific bands of the visible light spectrum were selected and representative light bulbs were used as the source. The bands included ultraviolet, blue, green, red orange, yellow and white.

Methods/Materials

Portable work light, glow in the dark stars, stopwatch and artificial light sources: 5W blue LED, 5W yellow LED, 25W Red, 25W green, 57W white and 60W blacklight. Determined the length of time a luminescent "glow-in-the-dark" star glows when exposed to a variety of artificial light sources. Used a dark room to block out ambient light and allow the luminescent star to go dark. Then stimulated the star by turning on an artificial light source and measured the exposure time using a timer for 5 minutes. At the 5 minute mark, the light source was turned off and a timer was used to measure the time required for the star to go dark. Used 7 artificial light sources including a soft white light as a control.

Results

An luminescent star exposed independently to 7 different artificial light sources. The time for the star to go dark after exposure was measured for each light source. A blue 5W LED source provided the most stimulation of a luminescent star taking 37 minutes and 32 seconds to go dark after exposure. A yellow 5W LED light source provided the least stimulation with the star glow only lasting 4 minutes and 54 seconds.

Conclusions/Discussion

After measuring the luminescent star's time to dark after exposure to the 7 artificial light sources, a distinct difference could be seen in the time it took the star to go dark. The original hypothesis was that exposure to 60W ultraviolet(black light) would generate the greatest stimulation of the luminescent star. In fact the ultraviolet light ranked 4th of the 7 light sources tested, ranking just below the soft white light source. It is concluded that specific bands of the light spectrum stimulate an luminescent object to varying and measurable degrees.

Summary Statement

As measured by "time to go dark" after exposure to a variety of artificial light sources, certain bands of the light spectrum were determined to stimulate an luminescent object to varying degrees.

Help Received

I performed the experiment myself. My science teacher and mentor Mrs. Haycraft provided guidance, support, and encouragement.