CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
S1717

Project Title
Stealthy Shapes: What Geometric Shapes Scatter the Most Electromagnetic Energy?

Abstract

Objectives/Goals
The objective of this study is to determine which of eight 3-D geometric shapes scatters the most light, by using a lux meter to measure reflected light.

Methods/Materials
Black-paper lined cardboard box, lux meter, led flashlight, various paper shapes.

Results
The shapes in order from ones that scattered the most light (reflected least light) to scattered least light (reflected most light) are:

Black Flat Face (54.07 lux Average)
2-inch V-Shape (114 lux average)
4-inch V-Shape (261 lux average)
2.5-inch W-Shape (699 lux average)
Crumpled Cylinder (844 lux average)
Cylinder (858 lux average)
1- inch WW-Shape (919 lux average)
3.5-inch W-Shape (946 lux average)
Flat Face (1297 lux average)

Conclusions/Discussion
It turned out that my hypothesis was partially correct. Both of the V-Shapes reflected much less light than the shapes without sharp edges such as the cylinder and flat face. However, I found that the W-Shapes and the WW-Shape reflected about the same, or more light than the cylinder, although all were less than the flat face. I discovered that it really depends a lot on the distance between the peaks on the shapes. The wider the shape was, the more light it reflects back.

Summary Statement
I showed that the amount of light reflected from an object depends on the shape of the object.

Help Received
I designed, built, and performed the experiments myself. My Physics teacher loaned me a lux meter for taking measurements.