Greater San Diego Science and Engineering Fair
2015 PROJECT SUMMARY

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Project Title: Are Higher-Priced Sunglasses Any More Effective In Blocking Ultraviolet Rays than Less Expensive Sunglasses?

Abstract

Objectives/Goals
The objective was to determine whether a correlation exists between the retail price of sunglasses and their ability to protect the eyes against harmful ultraviolet rays.

Hypothesis
The hypothesis of this experiment is that higher-priced designer sunglasses will provide 0% or a insignificant amount more protection from ultraviolet rays than less expensive generic sunglasses.

Methods/Materials
Using a UV photometer, 80 pairs of sunglasses ranging in retail price from less than a dollar, to nearly five-hundred dollars were tested for their ability to block ultraviolet rays. Each lens was tested separately and the results were recorded along with the retail price of the glasses, the manufacturer, lens material, and any claims included on the product literature. The amount of ultraviolet light passing through the lens expressed as a percentage was compiled for all specimens and the average of this numerical data was calculated according to eight price brackets of sunglasses. A graph containing summaries of all the data was compiled to show whether there was a correlation between price and UV protection.

Results
The data showed, regardless of price, that the sunglasses blocked an absolute range of between 96% and 100% of ultraviolet light. An average, the sunglasses blocked 98.06% of all UV light.

Conclusions/Discussion
The data strongly supported the hypothesis that the retail price of sunglasses has no bearing on the effectiveness in protecting the eyes against ultraviolet rays. The lowest priced sunglasses were just as effective as sunglasses costing nearly $500. Neither the polarization of the lenses nor the lens material appeared to have any significant impact on these results. Since sun-related diseases of the eyes appear to be a growing medical condition, the affordability of protective eyewear should not be an issue for the concerned public in obtaining adequate eye protection.

Summary Statement

Higher-priced sunglasses are no more effective than less expensive, discount sunglasses in protecting the eyes from ultraviolet light.

Help Received

Ophthalmologist Dr. Granet: provided key contacts carrying out the experiment; Meridian Labs/Essilor: provided UV Photometer; Optical Warehouse: provided sunglass specimens; Father: support/guidance; Mrs. Gillum: helped refine ideas, edited the papers, support/guidance.