CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
J1141

Project Title
Effects of Cameras, Eye Color, and Lighting on "Red-Eye"

Abstract

Objectives/Goals
The purpose of this project was to test ways to reduce "red-eye" in photographs using different types of cameras. Cameras that utilize the "red-eye" reduction feature reduce "red-eye" significantly. But these cameras can not eliminate "red-eye" completely. The "red-eye" reduction only minimizes the "red-eye" in a photograph by making the pupil contract. This project used different angles of light to eliminate "red-eye" completely.

Methods/Materials
Nine volunteers were photographed. Three subjects had blue colored irises, three had green colored irises, and three had brown colored irises. Four pictures were taken of each subject with each of four different types of cameras in the dark. Two of the cameras were digital. One of the digital cameras was a compact camera, the other was an SLR (single lens reflex) camera. The other two cameras were film cameras. One was a compact and the other was a disposable camera. The photographs were analyzed by applying the RGB computer color system to determine the hue of the subject#s pupils in the photographs. The RGB color system is a hexadecimal code that mixes the colors red, green, and blue to create any color. I compared the RGB color of each iris to a black to red gradient in order to determine the amount of #red-eye# in each photograph.

Results
The digital SLR camera reduced "red-eye" most. The disposable camera photographs had the second least amount of "red-eye". The photographs that showed the second greatest amount of "red-eye" came from the compact film camera. The camera producing the most red eye was the compact digital camera. The compact digital camera photographs revealed intense "red-eye" in every picture taken.

Conclusions/Discussion
The flashes that were placed at angles farther away from the lens of the camera resulted in reduced "red-eye." The Digital SLR camera, with and without the attachable flash, produced images with indistinguishable amounts of "red-eye." Cameras that have flashes located farther away from the lens of the camera, will create the least amount of "red-eye."

Summary Statement
This project used various angles of light and different cameras to eliminate "red-eye" in photographs.

Help Received
Thanks to Jeff McDowell for supplying a digital SLR Camera. Thanks also to my science teacher who provided support throughout the project.