CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J1809

Project Title
Speed Measurements Using a Strobe Light

Abstract

Objectives/Goals
If it's possible to measure the speed of an object moving in a linear path with a strobe light, then it's possible measure the speed of an object moving in a circular path.

Methods/Materials
To study circular motion, a pendulum with a radius of 2.086 meters was constructed in front of a dark sheet with a scale. To study linear motion, a rod was attached to a remote control car. A camera and strobe light were used to measure the motion of the pendulum and of the car. The test was completed 50 times for each. A stopwatch was used for the car and changes in angles for the pendulum. Results were compared to photographs and to formulae acquired through research.

Results
For linear motion, the difference between the actual speed and the strobe light's photographs had an error of 11.01%; small enough to display the strobe's ability to measure linear speed. For circular motion, the difference between the formula and the photographs at the bottom of the swing had an error of 18.43%; small enough to show the strobe light can measure speed in circular motion when variations are factored in.

Conclusions/Discussion
My hypothesis that it is possible to measure linear and angular speed accurately was correct. Not surprisingly because through research, I discovered that the strobe light could measure variables needed to calculate speed. I am pleased with my results because I achieved my goal of displaying my hypothesis.

Summary Statement
I tested a strobe light with a camera to see if it is possible to measure linear and tangential speed.

Help Received
Father helped execute experiment; 3 teachers at school helped me research, develope, and finish project.