CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
Alex J. Jacobs

Project Number
J0216

Project Title
The Physics and "Physiques" of Baseball

Abstract

Objectives/Goals
My objective was to determine if baseball bats, when illegally filled with cork in order to enhance the distance traveled by the ball, gives a baseball hitter an advantage over using approved baseball bat.

Methods/Materials
I researched the applicable physics, and how the corked bats were perviously made. After buying the materials, I assembled the batting machine using the materials listed below. Two altered baseball bats were prepared using the methods explained on the experiment display. Baseballs were placed on the tee, the bat was cocked to its maximum position and released. The ball was propelled into the air. The ground contact point was marked with a wood stake and the distance measured.

Materials (and tools) List: 1) 3 wooden baseball bats; 2) A vise; 3) A workbench with various hand and electric tools; 4) Electric drill motor; 5) Rolled sheets of cork; 6) Rubber bands; 7) Sandpaper; 8) Hand saw; 9) One large piece of plywood; 10) Drywall screws; 11) About 5 #2x4# planks of wood; 12) 2 springs; 13) One spring loaded hinge; 14) A baseball; 15) Batting tee (adjustable height); 16) Steel tape measure (to measure distance traveled by ball); 17) Metal spikes (to secure batting machine to ground).

Results
Using three different types of bats, I batted approximately 25 baseballs with each type bat. The bats used were 1) corked filled 2) rubber filled and 3) unaltered-standard. I was successful in collecting data and recording it to a spreadsheet.

Conclusions/Discussion
Although I observed a slight advantage to corking the bats, it appears that altering the bats does not make a substantial difference. My conclusion is that the reduction in the total mass of the bat (by removing wood and replacing it with a slightly lighter substance such as cork or rubber) undoubtedly increases the velocity of the bat at the point it strikes the ball. This increased velocity provides for a potential increase in energy to be transferred to ball. However, this benefit is offset by the fact that there is a reduction in weight in the section of the bat where it strikes the ball. The reduction of weight in this area tends to make the transfer of energy less efficient.

Summary Statement
My project was to determine if a consistent batting advantage could be substantiated by altering a standard baseball bat.

Help Received
Father assisted in cutting lumber through the use of power tools, and spotting the location of baseballs.