



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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Project Title
What Affects the Distance of a Hit Ball?

Abstract

Objectives/Goals
My goal was to determine what affects the distance of a hit ball.

Methods/Materials
Materials- wood bat (30 oz.); Composite bat (30 oz.); Aluminum bat (30 Oz.); baum swinging machine; jugs pitching machine; Easton batting tee; 15 softballs; Bushnell radar gun; 100 ft measuring tape.
I decided to test three differnt factors of hitting in my experiment.
First I tested three different bat matierials. A wood bat, a Composite bat, and an Aluminum bat. All three weighed 30 Oz.I put each bat in the swinging machine and set the swing speed for 28.4 mph and also at 44.3 mph. I recorded all of the distances and averaged them.
Second, I tested Bat wieght vs. Bat speed.To test weight the pitch speed (30 mph), the ball mass, and the swing speed (25 mph) were all kept constant. Only the weight of the bat was changed. With a radar gun, the speed of the ball when it left the bat was measured (15 times with each weight) and then averaged.
For speed, The ball mass, the pitch speed, and the bat weight(30 Oz.) were all kept constant. On the bat swing speed was changed. A radar gun was used again to measure the speed of the ball. The speeds were measured (15 times with each swing speed) and averaged.
Third, I tested was the sweet spot vs. the tip or the handle of the bat. The three bats were used again. The bats were all swung at 40 mph. The balls were placed on a tee and were hit with three different regions of the bat: The tip, the handle, and the sweet spot. The speed of the ball coming off the bat was measured and recorded.

Results
In the first experiment with the different types of bats , the composite bat won, the aluminum was second and the wood bat was third.
The second experiment was the speed and weight. I determined that both equally affect the distance of the hit ball.
In the third experiment i tested the sweet spot , the tip, and the handle.
The sweet spot of the bat hit the ball the hardest.

Conclusions/Discussion
In all my experiments the composite bat was the best. The problem I Sawwas that the bat was almost too good. I learned that when they test composite bats they test them brand new. As you use a composite bat small fibers on the inside break apart and ultimately make the bat more flexible. Since they test the bats brand new the results are not right. Since composite bats have been introduced, injuries on the ball field

Summary Statement
My project is about what determines how far and how fast you can hit the ball and the factors that go into it.

Help Received
My father helped me take down data during the experiment and also cut a bat in half for me. The president of the demarini sports bat section helped me by providing the testing materials that i needed.