CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
J0105

Project Title
A Cheater's Curve: The Science behind the Spitball

Abstract

Objectives/Goals
The objective was to determine if a smooth baseball, or "spitball", will generate a smaller Magnus force and less lift in flight than a normal baseball, and therefore cross home plate at a lower height.

Methods/Materials
One or two strips of electrical tape were wrapped around a pitching machine dimpled baseball to replicate the spitball. Taped balls were alternately thrown with control balls, which had no tape, at ~60 mph by a Atec pitching machine at a target 18.3 m (60 ft.) away. Each pitch was videotaped, and the X and Y location of the ball as it hit the target was measured from still video frames.

Results
The tests showed that the "spitball" crossed home plate an average of 32 cm lower (ball A) and 52 cm lower (ball B) than the control ball. Balls with one or two strips of tape crossed home plate at similar heights (difference 4 cm).

Conclusions/Discussion
Baseball pitchers sometimes cheat and apply spit or foreign substances to the ball in an attempt to alter its trajectory. My tests show smoothing a ball with tape had a large effect on trajectory, but different amounts of tape did not. The effect of spit or Vaseline on the trajectory of a major league pitch will most likely be smaller, but even a small change can be enough to make the batter whiff completely. Sadly, cheating has great advantages.

Summary Statement
This project tests the effect of surface roughness on the trajectory of a rotating baseball.

Help Received
Father videotaped experiment.