



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Nicholas Bayer; John Dike; Justin Hudson	Project Number S0102
Project Title It's a Blast! The Study of Aerodynamic Influences on Shotgun Pellets over Distance	
Objectives/Goals Our objective was to prove that shotgun pellets fired from a shotgun will continue spreading over increasing distances with lightest weighted shots having the largest spread. We also wanted to be able to map out exactly how the pellets change in motion over these distances.	
Abstract	
Methods/Materials One (1) Winchester 12 Gauge Shotgun Twenty (20) Rounds Winchester 8 Shot Shotgun Shells Twenty (20) Rounds Winchester 6 Shot Shotgun Shells Twenty (20) Rounds Winchester 4 Shot Shotgun Shells Sixty (60) Paper Targets One (1) Wooden Target Stand Two (2) Spring Clamps One (1) Measuring Tape One (1) Drafting Compass One (1) Ruler	
Measure distances of 10, 15, 20, and 25 feet from target stand. Clip target onto stand. Fire one (1) 8 shot round towards center of target from 10-foot mark. Replace target and repeat for a total of five (5) times. Repeat process for both 6 and 4 shots. Repeat process for all shot types at the 15, 20, and 25-foot marks. Measure all spread diameters on targets using a compass and a ruler. Start from outside of spread and come inward until a total of ten (10) pellets have been removed in order to eliminate outliers. Be sure not to measure the mark made by the wadding.	
Results The spread of each shot did increase over distance with the lightest weighing shots showing the greatest spread as measured by inches. However, we did note that the heaviest shots increased more over the four distances by percentage growth.	
Conclusions/Discussion The lighter shots had started spreading from the barrel of the shotgun immediately, but did not spread much after that point. Heavier shots, though, started out in a tighter formation but spread out more over increasing distances.	
Summary Statement The study of aerodynamic influences on mass and weight projections over distance.	
Help Received Mr. Bayer, Los Angeles Sheriff's Office, fired the shotgun at all times	