



CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

Name(s) Michael A. Raynis	Project Number J0122
Project Title Extreme Frisbee: Thrust, Angle, and Rate of Spin vs. Frisbee Flight Tendencies	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment was to determine the effect of rate of spin, thrust, and launch angle on a Frisbee's flight tendencies.</p> <p>Methods/Materials This experiment requires the construction of two launchers. One that will launch Frisbees at several variable rates and another that can launch Frisbees at two different angle, thrusts, and spin rates. Besides the materials used in the construction of the launcher, the materials for this experiment include a 150g Frisbee, an electric Dremel, 12 inch (366 cm) tape measure, masking tape, fluorescent tape, chalk, a stopwatch, a metric measuring wheel, and a metric spring scale. The first part of this experiment involves the use of Launcher A to launch the Frisbees at these different variable spin rates: 0, 5, 10, 30, 60, 100, 300, 600, 1000 RPMs. For each rate of spin, Launch the Frisbees 5 times and record each distance from the Launcher. The second part of this experiment involves the use of Launcher B to launch the Frisbees at a 9.58 kg or 16.75 kg of thrust, a 10 or 20 degree angle, and any fast or slow spin rate. Launch the Frisbees twelve times to test the effect of each of these variable pairs while controlling the other variables. Record each distance from the Launcher and analyze the data.</p> <p>Results When the Frisbees were launched at different angles, a 10 degree angle would make it go farther than a 25 degree angle (44.3m vs 34.6m). When the effect of thrust was tested a 16.75 kg thrust made Frisbees go farther than a 9.58 kg thrust (48.3m vs 34.7m). When the effect of spin rate was tested, a fast spin rate made Frisbees go farther than a slow spin rate (47.9m vs 23.9m).</p> <p>Conclusions/Discussion The experiment demonstrates that if either the rate of spin or thrust of a Frisbee is increased, it will fly farther, but if the launch angle is increased it will not fly farther. Aside from the data gathered from this experiment, research provided valuable information about the significance of the design of a Frisbee. Using both research and data, a new, more effective Frisbee design can be proposed. It involves a light-weight Frisbee with a heavy metal ring along its inner rim. This would direct all the force of a launch or throw to the Frisbee's angular momentum, making it go farther than a normal Frisbee.</p>	
Summary Statement The project demonstrates the effects of thrust, angle, and spin rate on a Frisbee's flight characteristics.	
Help Received Father assisted when using power tools; Instructor, Mr. Saramosing assisted with editing and revision; Younger brother assisted with gathering data.	