



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Adam M. Berger	Project Number 31908
Project Title Science of Soccer: Optimize Your Kicking Range	
Objectives/Goals My experiment was trying to test which contact position on a soccer ball will produce the maximum distance traveled. I will be helping all soccer players with the information they need to get the ball to fly as far as possible. My hypothesis is that the point of contact that will produce the maximum average distance will be the bottom middle portion of the ball, because it will give the ball lift for distance and reduce the amount of spin so that the ball will not slow down. Abstract Methods/Materials The experiment was accomplished by building a pendulum-like mechanism powered by bungee cords. The 5 ft. tall, 3 ft. wide mechanism was built out of metal conduit pipe and 2x6 wood with a 4 ft. long kicking arm. A size 3 soccer ball was placed on three different levels of wood planks that measured the vertical positions on the soccer ball. For every trial, the kicking arm was raised up and locked in place with a fence clasp attached to an adjacent conduit pipe. With the force of the two bungee cords pushing down on the kicking arm, the pendulum was released to strike the ball. The same procedure was carried out for nine contact points with ten trials for each. Results The independent variable in this experiment is the contact point on the ball, and the dependent variable is the distance that the ball traveled after contact. The dependent variable was measured by placing a piece of twine measured off in 5 ft. increments on the ground in front of the pendulum. For every measurement, we marked the point of first bounce to determine the distance from the pendulum. The data collected in my experiment rejected my hypothesis because the data points with the highest average distance was the soccer ball position that lies in the middle of the soccer ball, both horizontally and vertically. The average distance of the data taken at this position was 61.74 ft. Conclusions/Discussion Through my experiment, I learned that the best point to kick the ball is near the equator to achieve the maximum distance because this will create more force on the ball and will not have excessive amounts of lift. For players new to the sport or anyone trying to perfect their game, my experiment will show them how to get the most out of their kick.	
Summary Statement My project was trying to test the relationship between the point of contact on a soccer ball and the distance the ball travels.	
Help Received Father and grandfather helped with the design and assembly of the kicking mechanism; Parents and sister helped with collecting the data - marking and measuring the distances.	