



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Henry R. Solomon	Project Number J0228
Project Title Bend It Like Beckham or Magnus Force?	
Abstract Objectives/Goals I would like to learn how to kick a soccer ball in such a way that it appears to be heading straight, but curves away from goalie (or wall of defenders at the last second. I was always curious how David Beckham of the Los Angeles Galaxy was able to bend the ball around a wall of defenders and score an amazing goal. I would like to learn his awesome trick. Methods/Materials Use one size four soccer ball, one tape measure, one soccer goal that is 25 feet wide, and one soccer field. Follow these steps to complete the experiment: 1. Place a size four soccer ball 18 yards away from a 25 foot wide goal. 2. Lay a tape measure across the goal line. 3. Draw an X on the inflation hole of the ball. This will represent the middle of the ball. 4. Then draw 3 more Xs at 40mm, 80mm, and 120mm to the right of the center of the ball. 5. Kick the ball 20 times at each X, making sure that the top of your foot makes contact with each X. 6. After each kick, record how far to the right the ball was when it was half way to the goal, and when it enters the goal. 7. Once the ball has been kicked 20 times at each X, the experiment will have been completed. Results The ball curved the most when it was kicked at 80mm to the right of the center of the ball. When it was halfway to the goal, the average kick was 1.45 feet to the right of the center of the goal. When the ball was in the goal, it was 6.475 feet to the left of the center of the goal. Conclusions/Discussion When the results were calculated the ball curved the most when it was kicked at 80mm to the right of the center of the ball. It curved about 7.9 feet in total. This was surprising because the conductor predicted that it would curve the most when it was kicked at 120mm. In order for the Magnus Force to come into play, the ball has to have enough force applied to it. Because 120mm is so far to the right, it is hard to apply enough force. However, 80mm is not so far to the right, so more force was able to be applied. If you kick a ball in the right place with enough force, it will curve the most.	
Summary Statement I tested where to kick a soccer ball so it generates enough curve to bend around the goalie.	
Help Received My mother helped organize research and my father helped me measure the curve of the ball when I did my experiment.	