



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Lucas R. Kirby</b>	<b>Project Number</b> <b>J1515</b>
<b>Project Title</b> <b>Turf vs. Grass: The Ultimate Comparison</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment was to determine whether a ball's roll length varied on artificial Turf versus natural grass. <b>Methods/Materials</b> The experiment used a soccer ball, tape measure, a regular grass field, a Turf field, and a controlled kicking device. The experiment also used two saw-horses, a metal bar, a sledge hammer, a mason's level, a soccer cleat, and connecting materials, in an invented kicking device that strikes the soccer ball with controlled amounts of force. The distance that the ball traveled was measured with the tape measure. There were two different kicks: a lower impact kick, and a higher impact kick. This procedure was repeated on both surfaces multiple times in four directions, to control for slope. The experiment was conducted under common weather conditions to control for dampness, heat, and other factors. <b>Results</b> The kicking device successfully propelled the ball on a consistent rolling pathway, sustaining contact with the surface and thus testing the friction. This experiment showed that on average, the ball traveled 81% farther on the Turf field on the higher impact kick, and 88% farther on the lower impact kick. On Turf, the overall big kick average was 40'3" and on the small kick it was 20'3". On the natural grass surface, the overall big kick average was 22'3" and on the small kick it was 10'9". <b>Conclusions/Discussion</b> These results showed that when struck with the same force, a soccer ball rolls almost twice as far on Turf than it does on grass. Therefore, a soccer ball can be kicked softer on Turf than on grass and still travel the same distance. Soccer players should adjust their play accordingly.	
<b>Summary Statement</b> This experiment tests and proves that a soccer ball will roll farther on artificial turf versus natural grass.	
<b>Help Received</b> Mother helped type application; father helped carry kicking device to fields and took photographs during testing.	