Name(s)	Project Number
Dylan A. Manriquez	**J0320**

Project Title

Does kPa Affect the Kicking Distance of a Soccer Ball?

Abstract

Objectives/Goals

The purpose of this project is to see if a pumped up ball can travel farther than a flat ball. Based on my research on a soccer balls Kilopascals (kPa), I believed that the ball with twelve kPa would travel farther than the balls with four, eight, and ten kPa. I believed this because I thought the greater amount of air you put into the ball the farther it would go. The greater amount of air you put into a ball the more of a rebound the ball would give off. This extra rebound will keep the ball in the air longer, allowing it to travel farther.

Methods/Materials

Materials: 5 Digital Protractor x1,Soccer cleat,Size 5 soccer ball,fruit net and cabinet door hook
Method
1. Draw sketch of the machine. 2. Gather materials. 3. Build base. 4. Build pendulums. 5. Build the leg with the shoe. 6. Build the leg with the ball. 7. Combine components. 8. Test machine. 9. Conduct experiment at 27.57902916, 55.15805832, 68.9475729 (control), and 82.73708748 kPa. 10. Kick ball thirty times for each kPa. 11. Record data. 12. Graph data. 13. Mount the results on the board.

Results

It turned out that the ball with 4 kPa traveled the farthest. This shows that putting more air into a soccer ball did not affect the balls distance positively. It also shows that the less air (4 kPa) that was in the ball, the more rebound it gave off. The ratio changed because I was hitting the ball with the same amount of force. This was because the ratio of weight to 4 kPa (3/4) was closer than the ratio of 12 kPa (3/12). This extra rebound given off by the 4 kPa kicks allowed the ball to travel farther.

Conclusions/Discussion

Based on my research on a soccer balls Kilopascals, I believed that the ball with twelve kPa would travel farther than the other balls. My hypothesis however was incorrect. Instead of the ball traveling farther with greater kPa it traveled a shorter distance. This was because the ratio of weight of the shoe and foot 1.4515 kg to 27.57902916 kPa was closer than the ratio of 1.4515 kg to 82.73708748 kPa. This extra rebound given off by the 27.57902916 kPa kicks allowed the ball to travel farther.

Summary Statement

My project is about determining whether or not air pressure affects how far you can kick a soccer ball.

Help Received

My Grandfather helped me construct the mechanism. My cousin assisted me in learning the conversion equation. My father assisted me with the assembly of the board.