



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title
Energy Efficiency in the Energy Generation from an Inductive Coil Mechanism in Different Applications of a Moving Ball

Abstract

Objectives/Goals
If the inductive coil mechanism is placed inside a basketball with its heavier side(the surface of the basketball that's heavier than the rest) on top of either pole of the magnet, the ball will always bounce in the direction that will fully move the magnet up and down, thus producing electricity every time kinetic energy is input into it. For a soccer ball, the ball has to be kicked in a certain direction for the inductive coil mechanism to generate energy.
The objective of this project is to determine whether the energy generation from an inductive coil mechanism will be greater inside a basketball or inside a soccer ball.

Methods/Materials
Building Materials are Bouncy Putty, cardboard, toilet paper roll, wires, double-sided tape, zip lock bag, concrete mix, Velcro tape, and superglue. The testing material I used is a piezoelectric disc.

Methods: I built a bouncy ball made of Bouncy Putty. I cut the bouncy ball in half, put my inductive coil mechanism inside, and then hold the two half with Velcro tape. I bounced the ball ten times on a piezoelectric disc and then calculated the amount of energy generated by the inductive mechanism per an amount of forces applied each time through the voltages generated by the piezoelectric disc(which is proportional to the force applied on the disc). I did that same procedure, but instead of bouncing it, I kicked it.

Results
Inductive coil mechanism inside a soccer ball will generate more electricity than when it is inside a basketball. In fact, it is around 5.6 times more efficient in energy generation inside a soccer ball than if it is used inside a basketball, which can be seen through my data.

Conclusions/Discussion
Reason for the significant differences in the generation of energy of an inductive coil mechanism inside a basketball and a soccer ball could be the fact that when the ball is kicked, it rolls in a circular manner. And when it does, it fully moves the magnet from one end to another, thus maximizing the energy generation. Wherein a basketball, even if the same surface were hit every time, the magnet might not bounce high enough inside the coil for maximized energy generation.

Summary Statement
To determine whether an inductive coil mechanism inside a pre-made basketball in which everytime it is bounced, same surface will land, will generate more energy than if the inductive coil mechanism is inside a soccer ball.

Help Received