CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
J0214

Project Title
The Effect of Heat Transfer on the Resiliency of a Golf Ball

Abstract

Objectives/Goals
My objective was to see if the core temperature of a golf ball effects its flight distance. The purpose of my science project was to test the results of heat transfer on the resiliency of a golf ball. My hypothesis for this project was that by adding additional heat the resiliency of a golf ball will be increased and the golf ball will recover its original size and shape and thus bouncing higher.

Methods/Materials
25 golf balls, one steel cylinder, a golf ball dropper, a 304.8 centimeter ladder, a metric stick, two thermometers, a bowl, a test sphere cooling unit, a hot plate, water, a camera, a flip video camera, poster board, and a marker. The constants and controls in my experiment were using the 3 meter dropper, the height always stayed the same, I used the same type of thermometers, the steel target never moved, and the ball hit in the strike zone constitute, and I used the metric system. The variable in my experiment was the temperature, and I tested a wide variety of golf balls. The way that I measured the responding or dependent variable was I had 2 thermometers to double check the temperature, the ball stayed the same temperature as the other balls when taken out of the bucket, and the temperature in the bucket never changed.

Results
At the lower temperature (4°C), the molecules in the golf balls were relatively less active; it made it harder to have a reaction to the club. At room temperature (22°C), the molecules in those golf balls were in a more active state and the ball produced to be more resilient. However, in the highest test (44°) temperature the molecules being in a more active state increased the resiliency to a higher level. Those molecules were going crazy and bouncing off the walls.

Conclusions/Discussion
The results of this experiment were the balls with a higher core temperature proved to be more resilient and bounced higher. The balls that had a lower core temperature proved to be less resilient and responded by bouncing to a lesser level. My hypothesis proved to be correct, that the balls with a higher core temperature did indeed bounce higher. If I were going to do this experiment again, in the future, or expand on this experiment, I would make a machine that actually hit the golf ball and test the actual flight of a golf ball.

Summary Statement
My project is about golfing and temperature.

Help Received
Mr. McNutt is a science teacher that helped me get the golf ball dropper; mother helped me edit research paper and put the ball in the dropper; sister helped with pressing the button for the ball to drop; grandma and grandpa helped edit research paper; and golf pro lent me the golf balls.