CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J1120

Project Title
ZAP! Clothing and Car Seats Collide

Abstract

Objectives/Goals
The purpose of this experiment is to explore the dangers of static electricity at gasoline fuel pumps. There have been many articles written reporting that electrical sparks caused from common everyday static electricity were causing vapors from the gasoline at the fuel pumps to ignite. The problem occurs when a driver's clothing rubs against the car seat producing a build up of static electricity. When the driver touches the metal fuel pump, a spark can occur causing the vapors to ignite. The experiment conducted tested which type of car seat materials and clothing materials would produce the least amount of static electricity to avoid fuel pump fires and which produced the most static electricity to produce fuel pump fires.

Methods/Materials
Three types of car seat materials, cloth, leather, and vinyl and five types of clothing materials, wool, cotton, polyester, nylon and silk were tested. Equal sized balloons were rubbed ten times with each of the materials and then observed how strong the static electrical attraction was to each type of car seat. The terms strong, medium, weak or not at all were used to describe the attraction.

Results
The data supports the hypothesis that polyester clothes combined with vinyl car seat material will create the least amount of static electricity. The data concludes that the lowest frequency of static electricity was produced between the polyester fabric and the vinyl car seat, shown by weak or none at all during the experimental trials. The cotton fabric rubbed on the cloth car seat also showed weak levels of static electricity. 100% wool and 100% silk made the strongest levels of static electricity will all three types of car seats.

Conclusions/Discussion
According to the data, the vinyl car seats produced the least amount of static electricity with the five fabrics tested. Vinyl is not widely used in making car seats anymore, but a lot of older cars still have vinyl car seats. Leather car seats caused the strongest levels of static electricity with all five fabrics tested. This is a problem since many people choose leather car seats in the newer cars. The data showed that most of the combinations of materials and car seats created a lot of static electicity, which could increase the chance of a spark being produced.

Summary Statement
The purpose of this experiment is to explore the dangers of static electricity causing fires at gasoline fuel pumps by test ing five clothing materials against three car seat materials.

Help Received
Mother and Father let me use their cars. My next door neighbor, Mrs. Mathews let me use her car. My mother helped me type my report.