



CALIFORNIA STATE SCIENCE FAIR 2003 PROJECT SUMMARY

Name(s) Connie J. Lee	Project Number J1521
Project Title Heat: It's Everywhere, and It's Watching You!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to discover the factor that affects heat transfer the most as well as the materials that are the best conductor and insulator.</p> <p>Methods/Materials For my experiment, I used 62 materials that varied in their abilities to transfer heat. They were the shaggy carpet, netting type 1, foam type 1, woven carpet, unwoven carpet, suede paper, netting type 2, foam type 2, Astroturf, soft green fabric, leather, minigolf material, silk, ceramic tile, cork, foam and styrofoam, cotton, pine, vinyl, cardboard, nylon, wool, sponge, velcro, towel, styrofoam, shade type 1, paper type 1, paper type 2, shade type 2, wallpaper, denim, copper, nickel, wall panel, kitchen floor sample, gypsum, wax, bubble wrap, dried cement, plastic, rubber, latex, gold enclosed in plastic, magnet, brass, silver, clay, cement, coal, stone, fir, brick, fiberwood, redwood, spruce, cedar, poplar, aluminum, glass, tissue, rubber with cloth, and fiberglass. But for the experiment, I separated these materials into different categories. I also utilized the triple beam balance to measure the mass of each substance. While testing, I observed these in the sun for an hour and a half and measured their temperature every thirty minutes. I also retested many times using different equipment and procedures. To find the biggest factor in heat transfer, I calculated the data in different terms of mass, volume, and density.</p> <p>Results By using the idea that a greater density equals a higher conductivity, I established that density is a prime factor that influences heat transfer. I also discovered silver to be the best conductor while the unwoven carpet as the greatest insulator. The following are the best to the worst conductor categories: metals, building materials, miscellaneous, wood, carpet, cloth, paper, foam and rubber.</p> <p>Conclusions/Discussion My hypothesis proved untrue. Copper, although widely distributed around the world as a generic conductor, was not the best heat absorber. Wood was also not a good insulator. Silver ultimately proved to be the best conductor, and the unwoven carpet the worst. Also, density was a necessary factor in heat transfer, because electrons carry heat. However, the information from this experiment is vital to society. By controlling heat transfer, one can save energy and further technology. Also, the knowledge of conductors and insulators may prevent future injuries by having equipment made of appropriate substance.</p>	
Summary Statement This project explores the various factors that influence heat transfer as well as the most efficient conductor and insulator.	
Help Received My parents helped me move the tables out into the sunlight and drove me to many places so that I could gather my materials. My teachers, Mr. Perry and Mr. Kaleikau, lent me their triple beam balance so that I could measure mass accurately.	