



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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| Name(s) Evan S. Stanford | Project Number J0534 |
| Project Title What Type of Fuel Has the Greatest Energy per Unit Mass? | |
| Abstract Objectives/Goals The purpose of my project was to determine which fuel had the greatest energy density. I hypothesized that gasoline would have the greatest energy density because it is used commonly in many forms of transportation. Methods/Materials In my experiment I used a home-made calorimeter to measure the energy of combustion for paraffin wax, gasoline, vegetable oil, diesel, sterno, and wood. A calorimeter is a device used to determine the amount of energy given off during a chemical reaction by measuring the change in temperature of water surrounding a reaction crucible. I recorded the starting temperature of the water and the mass of the fuel that I placed in the calorimeter. The fuel was lit and oxygen was circulated through the container. I sealed the crucible and placed it into a large bucket of water. After twenty minutes I stopped the experiment and measured the change in temperature of the water and the change in mass of the fuel. With this information I calculated the total energy released and the energy density of each fuel. Results My experiment showed that paraffin wax had the greatest energy density of the six fuels I tested, while wood had the lowest energy density. Conclusions/Discussion My conclusion did not support my hypothesis, although gasoline did have the second greatest energy density. This experiment shows that there is a significant difference between various fuels and suggests that in the future wax may become a more vital source of energy. | |
| Summary Statement This project used a calorimeter to determine the energy densities of six different fuels. | |
| Help Received My science teacher suggested using a calorimeter, my father helped acquire the supplies for the calorimeter and helped supervise all gasoline testings, and my mother proofread my papers and purchased the backboard. | |