



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

Name(s) Lance H. Brown	Project Number 35026
Project Title Flame War: Which Combustible Fuel Is the Most Efficient?	
Objectives/Goals The reason I am trying to find out what combustible fuel source produces the most energy, is because most fuel sources are limited, and we need to find a sustainable fuel source to power technology. If I burn 10 grams of the following fuels: 91% alcohol, 70% alcohol, wood, charcoal, sterno and gasoline, then I believe gasoline will produce the most heat, followed by sterno, 91% alcohol, 70% alcohol, charcoal and then wood. The constants in my tests were the amount of water heated and the amount of fuel. The variables were the fuels I used. My control was gasoline, because it is a very common fuel and produces a great amount of energy. The results of this experiment will help determine what combustible fuel should be used for a specific job based on its supply, cost and efficiency.	Abstract Methods/Materials I positioned a flask of water above the fuel source and recorded the change in water temperature before and after burning the fuel. Using the specific heat of water I calculated the energy produced. Materials; 1.125mL Erlenmeyer flask, 2. Tripod with mesh screen, 3. Matches, 4. Scale, 5. Stopwatch, 6. Wood, 7. Sterno, 8. Rubbing Alcohol 91%, 9. Rubbing Alcohol 70%, 10. Gasoline, 11. Charcoal, 12. Ceramic bowl, 13. Thermometer Results The fuels tested produced the most heat in the following ranking: 1. Gasoline, 2. 91% Alcohol, 3. 70% Alcohol, 4. Sterno, 5. Wood, 6. Charcoal Conclusions/Discussion My results were not exactly what I thought they were going to be. I thought that the order would go gasoline, followed by Sterno, 91% alcohol, 70% alcohol, charcoal and then wood. I realized that Sterno was not as good of a fuel as I thought. I also thought charcoal would produce more heat. I also found out that 91% alcohol produced almost as much energy as gasoline. 91% Alcohol would be a good substitute for gasoline in vehicles because it burns cleanly, but it is more expensive. Wood and Sterno are good for heating food because they produce a medium amount of heat for a long time. Charcoal would be a good fuel if it was available in large quantities.
Summary Statement My project will help people make the right choices about what fuel to use because fuel sources are limited.	
Help Received My dad helped me design the apparatus and helped me find the equation to calculate the amount of energy produced.	