



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Lance H. Brown</b>	<b>Project Number</b> <b>J2006</b>
<b>Project Title</b> <b>Flame War: Which Combustible Fuel Is the Most Efficient?</b>	
<b>Objectives/Goals</b> 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.	
<b>Abstract</b>	
<b>Methods/Materials</b> 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	
<b>Results</b> 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	
<b>Conclusions/Discussion</b> 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.	
<b>Summary Statement</b> My project will help people make the right choices about what fuel to use because fuel sources are limited.	
<b>Help Received</b> My dad helped me design the apparatus and helped me find the equation to calculate the amount of energy produced.	