



CALIFORNIA STATE SCIENCE FAIR

2015 PROJECT SUMMARY

Name(s) Lance H. Brown	Project Number J2006				
Project Title Flame War: Which Combustible Fuel Is the Most Efficient?					
<div><div>Objectives/Goals<p>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.</p><p>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.</p><p>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.</p></div><div>Abstract</div></div> <div><div>Methods/Materials<p>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.</p><p>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</p></div><div>Results<p>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</p></div><div>Conclusions/Discussion<p>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.</p><p>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.</p></div></div> <tr><td colspan="2">Summary Statement<p>My project will help people make the right choices about what fuel to use because fuel sources are limited.</p></td></tr> <tr><td colspan="2">Help Received<p>My dad helped me design the apparatus and helped me find the equation to calculate the amount of energy produced.</p></td></tr>		Summary Statement <p>My project will help people make the right choices about what fuel to use because fuel sources are limited.</p>		Help Received <p>My dad helped me design the apparatus and helped me find the equation to calculate the amount of energy produced.</p>	
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