



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Sierra A. Stingl	Project Number J1527
Project Title Algae Fuel to the Rescue!	
Objectives/Goals Can algae be cultured to help produce a bio-diesel fuel? Can oil be extracted from the algae? How will the characteristics of this Algae Fuel such as burn time and temperature compare to regular #2 diesel fuel?	
Abstract	
Methods/Materials <ul style="list-style-type: none">* Bleach all materials being used and rinse* Pierce the caps of two 2 liter bottles and connect 50mL tubing to each* Insert tubing to the bottom of the bottles* Connect tubing to a 4 gang manifold and connect to an air pump* Set up a fluorescent light next to the culturing bottles* Pour sterilized water and algae into the bottles* Feed algae 0.3 mL of nutrients using a 1 mL Monojet syringe* After 2-3 weeks harvest the algae by pouring liquid through coffee filters* Mix dry algae with sterile sand and blend thoroughly* Add 50 mL 91 octane gasoline* Boil the mixture* Extract algae oil by adding 25 mL #2 diesel fuel and pouring through 2 coffee filters* Take 1 mL of the produced Algae Fuel and light on fire* Record time that the product burns and the temperature increase of 10 mL of water* Repeat 10 times* Take 1 mL #2 diesel fuel and repeat 10 times as above	
Results <p>Results indicate substantially longer burn times for #2 diesel in comparison to the Algae Fuel. Heat production data is still being compiled. Algae Fuel produced less visible smoke and left less residue in the mortar indicating a cleaner burn.</p>	
Conclusions/Discussion <p>I conclude that algae can be cultured to make burnable oil, that this algae oil is extractable, and that the algae oil can be mixed to make Algae Fuel. This fuel has the ability to produce heat and run an engine, although less effectively than the regular #2 diesel fuel. The Algae Fuel burned cleaner and was less toxic than the regular #2 diesel fuel. The question remains, is the world ready to begin producing bio-diesel fuels such as Algae Fuel?</p>	
Summary Statement <p>I produced an algae based bio-diesel fuel and compared the burn characteristics to regular #2 diesel fuel.</p>	
Help Received <p>E-mailed an engineer to ask questions when I was confused.</p>	