



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Ezra B. Creighton	Project Number S1897
Project Title Making a Four Stroke Engine Run on Water, Instead of Gasoline	
Abstract Objectives/Goals Today four stroke gasoline engines control our transportation. These engines are polluting the environment and run on a limited fuel. I've proved before that HHO added to the air-fuel mixture can improve fuel efficiency of a engine. This because HHO is an explosive gas made of hydrogen and oxygen. If HHO can supplement gasoline, maybe I can build a HHO generator to safely power an engine with no gasoline at all. I produced the HHO by using electrolysis to split water molecules into separate gases. Due to HHO being a very flammable gas I hope when I put it into the engine it will take gasoline's place in running the engine. If I can run an engine it will prove that HHO can be safely made at home to replace gasoline. When HHO is combusted in the engine, it turns back into water. If HHO was used to run engines we would have an abundant amount of free fuel that is environmentally friendly. My design has to run the engine and be safe. Methods/Materials My first HHO generator prototype did not fulfill the design criteria so I remodeled it before starting my testing. First I made sure the four stroke engine could run on gasoline. After making sure the engine was out of gasoline, I put the HHO tube into the air intake of the carburetor. I let pressure build up in the generator. Next I pull started the engine as I released the pressure to allow the HHO to surge into the engine's intake. The engine backfired on a test and cracked my generator, so I remodeled with a different safety. Results Prototype 1 didn't work because the safety was not working properly. I remodeled the generator (prototype 2) to have a working safety so it would not be dangerous in case of a backfire. Prototype 2 successfully started the engine. But prototype 2 broke after a backfire. Prototype 3 was able to successfully run the engine 18 times without fail. The run times varying with the amount of HHO in the system. Prototype 3 was successful in fulfilling the design criteria. Conclusions/Discussion My tests show that an engine can run on HHO! The engine would run when the HHO surged into the engine but not run without it. This proves that HHO can be easily manufactured to run an engine. Since HHO can replace gasoline if we used it in our engines we would save money, fuel and have emissions that will help save the environment. HHO can be produced for free if solar panels are used to provide the electricity to run the HHO generator.	
Summary Statement This project proves that a four stroke, 13.0 horsepower engine can be made to run on a safe, homemade HHO generator.	
Help Received I would like to thank Mike Bell for his help in fixing the problems with the HHO Generator and the engine, as well as for proofreading. I would also like to thank my dad for getting the pieces to make the generator and the use of his engines and tools. Also Audrey Bell for proofreading.	