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*Water Purification Off The Grid*

This project was designed to determine if a Fresnel lens can be used to boil water and capture the steam to produce pure water. A Fresnel lens, solar tracker, and a gear motor all work together to boil water. The Fresnel lens focuses the sun's energy onto an aluminum block which is submerged in water. A 12 volt DC battery is wired to the solar tracker to provide power. The solar tracker is wired to the gear motor and controls its rotation depending on the position of the sun relative to the solar tracker. The gear motor is attached to the lens assembly and keeps it aligned to the sun during operation. The first design, a kettle boiler, radiated too much heat to boil water. The second design was a high temperature plastic boiler which yielded better results because of the low conductivity of plastic. Heat loss was still a major hurdle that prevented the second design from boiling water. The system was further modified by adding three layers of insulation which allowed it to boil water after approximately 50 minutes. The test results and data analysis indicate that a Fresnel lens is capable of boiling water. The results of the experiment show that if the unit was built on a larger scale, it could provide safe drinking water to a large number of people. This unit is completely portable and is capable of being transported to remote locations if necessary.