



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title Thermoelectric Converter	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In almost every form of energy use, whether it is braking on a bike or lighting a match, heat energy gets released and is most commonly lost. The purpose of this experiment is to use a thermoelectric converter to analyze how and how efficiently the Peltier and Seebeck effects could be used for energy recycling to convert electric energy to thermal energy and vice versa.</p> <p>Methods/Materials A thermoelectric converter was used to convert electricity into thermal energy and thermal energy into electricity. Calculations of the energy flow were used to analyze the efficiency. I further tested whether a temperature difference over a distance could be used.</p> <p>Results The experiments show that conversion of electric energy to thermal energy(heating and cooling) by means of a thermoelectric converter has a lower efficiency than conversion of electrical energy to thermal energy. The efficiency of both processes is less than 5%. -The practical part of the experiments show that the temperature difference can be separated over a physical distance and transported to the converter electrodes by means of a temperature transducer(aluminum rod).</p> <p>Conclusions/Discussion Thermoelectric conversion is not very efficient but can be of practical use, if it allows to recycle at least some of otherwise excessively lost energy (e.g. brakes), or if it takes advantage of naturally occurring temperature differences.</p>	
Summary Statement Conversion of heat into electricity and vice versa.	
Help Received Worked at Ribet Academy's Seebeck Physics and Chemistry Lab	