



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> Avi G. Vogel	<b>Project Number</b> <b>J0714</b>
<b>Project Title</b> <b>Determining Which Rocks Put Out More Heat by Boiling Them</b>	
<b>Abstract</b> <b>Objectives/Goals</b> In this experiment, the purpose was to discover the heat output of rocks. Which rocks would produce more heat: Igneous (Pumice/Basalt), Sedimentary, or Metamorphic? <b>Methods/Materials</b> This would be done by putting the rocks in boiling hot water for 240 seconds while an oven thermometer would record the heat output. The experiment called for 6 Igneous pumice rocks, 7 Igneous Basalt rocks, 5 Sedimentary Limestone rocks, 6 Metamorphic Rose quartz rocks, 2 pots that were 2 1/2 liters, 2 oven thermometers that are NSF, and 1 liter of water for each of the rocks in each experiment. <b>Results</b> <b>Results</b> The tables that were derived from this experiment show that the pumice rocks overall released the third most amount of heat in the experiment. They also were the lost heat more gradually than the rest of the rocks. The basalt rock#s heat measurement were radical and went up and down in the middle of the experiment. It also had the second highest overall heat output. The metamorphic rock had the highest overall heat output. The temperature of the rock rose gradually, and only sometimes fell into a lower heat. The sedimentary rock had the lowest overall heat output. On every experiment, it was either of medium temperature, or of a low temperature. This is what caused it to have the least overall heat output. Both of these charts and graphs show the overall outcome of this experiment. <b>Conclusions/Discussion</b> In the experiment, the results showed that the metamorphic would export the most heat. The results suggest that ancient man could have used rocks, but in order to generate adequate heat, it would have to include great quantities. This project is important because it could contribute to revealing how ancient man kept warm. What rocks did he use, and was it even possible that he could use rocks to provide warmth to his caves. Research in this area would also contribute to discovering if rocks could be used to power electronics such as toy cars, gaming consoles, and maybe one day, cars. One last reason that this would be important is that it could lead future generations into taking this topic into more extensive research How have rocks endured on this planet? Why haven#t all of them eroded into sand? Can rocks absorb carbon dioxide and make this planetary body cleaner?	
<b>Summary Statement</b> Determining Which Rocks Put Out More Heat by Boiling Them.	
<b>Help Received</b> Teacher helped me with testing the rocks, Mother helped me design board	