



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> Shayla A. Stewart	<b>Project Number</b>  22823
<b>Project Title</b> Brighten That Lightstick	
<b>Objectives/Goals</b> To determine the affects of vibration, pH level, and temperature on the chemical reaction inside a lightstick. <b>Abstract</b> <b>Methods/Materials</b> First a box for measurements was constructed. Then the lightsticks were placed inside containers of the desired temperature and measurements were took of light output every 20 minutes until there was no measurable light. For pH, different solutions with different pHs were mixed and measurements were taken of that light output. To test vibration, the lightsticks were duck taped to a massager and then measured in 20-minute increments. <b>Results</b> Temperature and pH level both strongly affected the chemical reaction while vibration did not affect the chemical reaction at all. The higher the temperature the brighter the light but for a shorter period of time, while the lower the temperature the duller the light but for a longer time period. In pH, the basic solutions created light while acidic solution did not. It was found the solutions must be between 5-6 to create light for a long period of time. <b>Conclusions/Discussion</b> The hypothesis was proven to be partially correct. Both temperature and pH affected the chemical reaction, but vibration did not. The results may pertain to some chemical reactions. Chemical reactions can occur faster at a higher temperature and at different pH levels. The chemical reaction inside a light stick works best if activated at a higher temperature and has a basic pH level.	
<b>Summary Statement</b> The affect of vibration, pH, and temperature on the chemical reaction inside a lightstick.	
<b>Help Received</b> My parents, especially my father, helped oversee handling the chemicals used in project.	