



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Alex T. Fukunaga	Project Number J1210
Project Title Carbon Dioxide, What a Waste! Changes in Carbon Dioxide Levels During Exercise in Boys and Girls	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to measure the changes in exhaled carbon dioxide levels before and after exercise in boys and girls. My hypothesis is if carbon dioxide levels of five girls and five boys were measured before and after exercise, then the levels would be higher after exercise and that the boys would have higher levels than the girls.</p> <p>Methods/Materials Five girls and five boys ages 12-14 years old exhaled into cups of water at baseline and after push-ups, sit-ups and jumping jacks on three different days. The pH of the water was measured using a pH meter.</p> <p>Results Comparing the overall average pH levels for boys and girls, both groups lowered their pH levels from baseline to the end of the exercises. However, the girl subjects had a larger drop in pH levels (0.3) compared to only (0.1) for the boy subjects.</p> <p>Conclusions/Discussion After exercise, the average exhaled carbon dioxide level increased in both boys and girls which is consistent with my first hypothesis. A decrease in pH levels corresponds to an increase in acidity from the presence of carbon dioxide, which dissolves in water to form carbonic acid. However, the girls had a higher average carbon dioxide level at the end of the exercises than the boys which does not support my second hypothesis. These differences indicate that there could be other factors that influence exhaled carbon dioxide levels after exercise.</p>	
Summary Statement The project studies the changes in exhaled carbon dioxide levels during exercise in boys and girls.	
Help Received Mother helped with purchase of supplies.	