



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Bethany J. Johnson</b>	<b>Project Number</b> <b>J1312</b>
<b>Project Title</b> <b>Just Keep Swimming: A Study of Asthma and Swimming</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This project was designed to answer the question whether swimming competitively is helpful in reducing the effects of asthma in children aged 11 to 13. Some research suggests that the controlled breathing, cardiovascular fitness, and moist environment involved in swimming may improve lung function, even in asthmatics. Other research, though, is showing that chlorine exposure may be causing asthma or worsening its effects. I wanted to find out which was true. <b>Methods/Materials</b> A water displacement method was used to measure the lung capacity of the subjects. This included a one-gallon milk jug, marked at 250ml levels, flexible irrigation tubing, an elbow coupler and a straight coupler, a large plastic basin of water, and a bathroom scale and measuring tape to find the body surface area of each subject. The students were asked to take in a deep breath and blow the air completely out of their lungs into the tube which was placed inside the jug, submerged in water. The volume of water that was forced out was recorded and the process repeated two more times. The results were compared to predicted lung volumes for the person, based on body surface area. <b>Results</b> The results showed that swimming does appear to improve the lung capacity of the swimmers, even when asthma is present. 58% of swimmers performed above their predicted capacities, but only 7% of non-swimmers did. 87% of asthmatic swimmers performed above the prediction, and only 33% of asthmatic non-swimmers did. <b>Conclusions/Discussion</b> The sport of competitive swimming appears to have a beneficial effect on the lung function of middle school students, even if they have asthma.	
<b>Summary Statement</b> This is a study comparing the lung capacity of swimmers, both with and without asthma, with non-swimmers, with and without asthma.	
<b>Help Received</b> Mother helped with typing and obtaining some parent permission slips. Father helped cut the tubing, explained the math formula and assisted with set up of Excel.	