



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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Project Title Increase Your Fitness, Inflate Your Ego	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project was to find the difference between an athlete's lungs and those of a non-athlete. I wanted to test the effect that staying active has on one's body, and therefore, I chose to measure the tidal volume and the vital capacity of each of my participants' lungs. My collecting this data, I was able to find out exactly how much of a difference there is between the two groups' lung volume.</p> <p>Methods/Materials Began by gathering 20 athletes and 20 non-athletes, along with about 15 woodwind musicians and proceeded to record their age, gender, height, weight, and activity level (if any). Proceeded to calculate the subjects' expected lung capacity (or, the volume of air contained in the lungs at the end of maximal respiration) with the information provided from their body surface area, using Mosteller's equation. Went on to estimate the subjects' vital capacity by multiplying the products from the person's body surface area by 2500 (for males) and 2000 (for females). After estimating the participants' lung and vital capacities, continued on to perform the procedure of measuring the tidal capacity and the vital capacity of the various people using the "balloon method". Stretched out a round balloon several times (to relax the material) for each new volunteer, and then proceeded to measure the tidal capacity by having the person inhale normally and then exhale normally into the balloon. After pinching the end of the balloon to keep the air in, the diameter of the balloon was measured. After recording the data from three trials, commenced with the second test. Using the same balloon and the same subject, the person inhaled as much air as they could and then exhaled forcefully into the balloon, this measures one's vital capacity. Then, pinching the end, the diameter was measured and data was recorded after three trials. After calculating the average diameter, went on to look at a graph that had lung volumes (in cubic centimeters) in correspondence with the average diameter of the balloon. Then according to the graph, record the volume of the individuals' lungs.</p> <p>Results As predicted, the athletes tested had greater lung capacities than non-athletes, though some participants showed varying results.</p> <p>Conclusions/Discussion This project was interesting and put an emphasis on the different body types of individuals and their abilities.</p>	
Summary Statement Testing the lung capacities of athletes and non-athletes, lung volumes were estimated, measured, and then compared.	
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