



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Rebekah M. Silva	Project Number S1012
Project Title The Effects of Weight Training and Aerobic Exercise on Body Measurements	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Experiment combined isotonic exercises, a type of weight training, with aerobic exercise on a treadmill to assess whether lighter weights used with more repetitions or heavier weights used with fewer repetitions would be more effective for losing inches (millimeters) and improving overall body measurements.</p> <p>Methods/Materials Informed consent was obtained from 10 experimental and 2 control subjects, one per age group tested. Seven completed experiment. Upper thighs and upper arms of experimental and control subjects were measured before and after experiment. Weight training 3x/wk consisted of lifting 2 lb (907.2 g) free weights on left arms, 2 lb (907.2 g) ankle weights on left legs, 5 lb (2268 g) free weights on right arms, and 5 lb (2268 g) ankle weights on right legs. Number of repetitions was adjusted so total weight lifted on each side was constant, but repetitions/set were higher with lighter weights. Aerobic exercise 3x/wk consisted of walking on a treadmill at 2.5 to 3.5 mph for 30 min or until the target heart rate was achieved to equalize intensity among subjects, preventing age and metabolism from acting as confounding variables. Stretching exercises to prevent injury were discussed and demonstrated.</p> <p>Results Left upper arms and thighs, which used 2 lb (907.2 g) weights and more repetitions, lost more inches (millimeters) than right upper arms and thighs, which used 5 lb (2268 g) weights and fewer repetitions. Right upper arms and thighs bulked up, showed no change, or decreased in circumference less than left upper arms and thighs. Results are reported in Table 1 and Figs. 1 and 2 as millimeters lost or gained in upper arms and thighs.</p> <p>Conclusions/Discussion Experimental subjects lost or gained millimeters in skeletal muscles in upper arms and upper thighs in the pattern predicted by the hypothesis. Using lighter weights with more repetitions (left upper arms/thighs) was more effective for toning and losing inches than using heavier weights with fewer repetitions (right upper arms/thighs). Results for right upper arms/thighs suggested that heavier weights/fewer repetitions, in most cases, improved muscle size and strength. Follow-up experimentation with a larger sample size and for a longer duration is necessary to confirm validity of initial results.</p>	
Summary Statement Experiment combined aerobic exercise with weight training to assess whether lighter weights used with more repetitions or heavier weights used with fewer repetitions was more effective for losing millimeters.	
Help Received Mom drove me to the UC Riverside Science Library. Dr. Joy Peoples and Dr. Carol J. Lovatt critiqued my Science Fair Board after I had been selected to compete at the RIMS Regional Science Fair.	