



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Danielle Salt	Project Number J0529
Project Title Cigarette Filters: Do They Really Work?	
Abstract Objectives/Goals My objective was to see how much of a difference there was in tar and smoke particulates inhaled from the smoke of ultra-light, filtered, and non-filtered cigarettes. In addition, I wanted to determine the quantity of smoke inhaled by a nonsmoker from second-hand smoke. Methods/Materials I assembled a filtering apparatus with a vacuum pump that pulled the smoke from a lit cigarette through a paper filter, which I weighed to determine the amount of tar and smoke particulates in each type of cigarette. I also calculated the percentage of a cigarette theoretically smoked by a nonsmoker in an eight hour day in a room with a smoker. Results There was a significant difference between the milligrams of tar and smoke particulates in the ultra-light, filtered, and non-filtered cigarettes, with Marlboro Ultra-lights at an average of 64.7 mg, Marlboro Filtered at 96.6 mg, and Camel Non-filtered at 157.9 mg. The calculated results for milligrams of tar and smoke particulates inhaled from second-hand smoke from an ultra-light cigarette was 7.6 mg, a filtered cigarette was 8.32 mg, and a non-filtered cigarette was 13.39 mg over an eight hour period of time. Conclusions/Discussion In conclusion, ultra-light cigarettes contain the least amount of tar and smoke particulates when inhaled and are the safest of the three types of cigarettes that I tested. They also put the least amount of risk on smokers and nonsmokers that are inhaling second-hand smoke. Filtered cigarettes are also safer than non-filtered cigarettes for the same reasons. Also, secondhand smoke is not as dangerous as many are led to believe, based on my research and calculations.	
Summary Statement I measured the milligrams of tar and smoke particulates in ultra-light, filtered, and non-iltered cigarettes, as well as quantifying the milligrams of tar and smoke particulates inhaled from second-hand smoke by a nonsmoker in eight hours.	
Help Received Father assisted with experiments and calculations.	