



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Benjamin J. Griffith</b>	<b>Project Number</b> <b>J1312</b>
<b>Project Title</b> <b>Bacteria Wars</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Which household cleaner out of the following (Clorox, Formula 409, Pine-Sol, & Windex), will outperform its competition by killing the bacteria on a surface that it is applied too? <b>Methods/Materials</b> Wash hands, use sterile gloves, label petri dishes, make bacteria food with water, un-flavored gelatin & beef bouillon. Pour mixture in each labeled petri dish. Label sections of counter & separate with tape. Section #1= Clorox Test. Section #2= Formula 409 Test. Section #3= Pine-Sol Test. Section #4= Windex Test. Crack open two eggs into a bowl, let sit for 1 hour @room temperature. With a brush, wipe the eggs on to each sectioned-off piece of counter top. Use sterile swabs & take a smear of each section. Then gently glide it across its petri dish. Be careful not to touch the prepared petri dishes with your hands. Repeat the prior step, three more times with new sterile gauze pad each time and change gloves after completing each section. The Control Group is this first group of dishes, which represents countertops with egg, swabbed & put into the dish, but no cleaner. The Experimental Group are countertops that were covered with egg, but cleaned with a specific cleaner, then swabbed, then applied to a petri dish. This experiment was conducted three times, results totaled & averages were graphed and analyzed. <b>Results</b> The control group grew several types of bacteria, mainly brown dots that were 1/16" in diameter & white cloudy formations or blobs that were 1/8" to 1/4" in diameter. White cloudy growth grew in globs that ranged from 1/16" to 1/4" in size.  The experimental group was effective in reducing or eliminating the volume and types of growth that were seen in the control group. By graphing the results of the Control Group versus the Experiment Group for Sections 1-4, it was apparent that the chemicals of the household cleaners reduced the bacteria that grew in the petri dishes. <b>Conclusions/Discussion</b> In first place, Clorox beat out its competition by having the best overall performance in killing brown & white growth, & having no other bacteria grown in its petri dish. In second place was Windex, which killed brown & white growth, & had no other bacteria grown in its dish. In third place, Pin-Sol killed brown & white growth, & had only a small orange growth. In last place was Formula with the worst results of killing brown growth bacteria and also growing the largest other green growth.	
<b>Summary Statement</b> My project was about testing four household cleaners effectiveness in killing bacteria in an environment with controls and variables.	
<b>Help Received</b> My dad helped me to register on-line, and encouraged me to work hard and do my best.	