



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Jeremy A. Fuster	Project Number J1313
Project Title GSI: Bacteria A Gram Stain Investigation: The Number and Type of Bacteria on Frequently Touched Surfaces at School	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to see which of six commonly touched surfaces found at school had the most bacteria, to identify them, and to see if an antibacterial wipe was effective in eliminating them. My hypothesis is that the locker knob and toilet handle will have the most bacteria, and that the wipe will eliminate them.</p> <p>Methods/Materials First, the six surfaces were swabbed with sterile swabs and smeared on agar plates. Next, each surface was cleaned with a Clorox wipe. The surfaces were then swabbed and smeared on agar plates. The plates were placed in an incubator at about 38 degrees Celsius for 2 days. The bacterial colonies that grew on the plates were observed. Their number and appearance were recorded. One colony of each appearance type was swabbed and heat-fixed onto a glass microscope slide. Next, the slides were Gram-stained. The slides were placed under a compound microscope and the shape and staining of the bacteria were recorded. The shape was recorded as cocci, bacilli, or cocco-bacilli. Gram positive bacteria stained blue; gram negative pink.</p> <p>Results The toilet handle had the most bacteria which were mostly Gram positive cocci. Gram positive cocci was the most common bacteria on dry surfaces. Gram negative bacilli were found on the water fountain (wet surface). The Clorox wipes eliminated many but not all bacteria on all the surfaces, but was least effective on the water fountain.</p> <p>Conclusions/Discussion Most of the Gram positive bacteria found on the dry surfaces probably were harmless skin bacteria, but there is a chance that they could have been harmful bacteria. Additional tests such as catalase and coagulase tests could help determine whether they were harmful or harmless. My hypothesis, that the locker door and toilet handle would have the most bacteria, was partially correct. The toilet came in first place, but the fountain, not the locker, came in second. The Clorox wipes eliminated most, but not all bacteria. The total number of colonies before wiping was 361, after wiping, 80. The wipes did not eliminate 99.9% of bacteria as claimed. The wipes were least effective on the water fountain mouthpiece. This may be because the disinfectant was diluted by the water. Based on my experiment, I would give others these words of advice: wash your hands and drink bottled water!</p>	
Summary Statement My project is about discovering what types of bacteria can be found on commonly touched school surfaces, typing bacteria using Gram stain, and determining if disinfectant wipes eliminate these bacteria.	
Help Received Father taught me how to Gram-stain, count bacterial colonies, identify different bacteria; once I learned methods, did project on my own. Dad helped take pictures; mother helped with paper cutter for board.	