CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J2011

Project Title
"Handy" Solutions

Abstract

Objectives/Goals
Our objective was to find out if hand sanitizer is really as effective at killing bacteria when cleaning hands as liquid hand soap.

Methods/Materials
Materials used:Water,Liquid hand soap,Hand sanitizer,Blow dryer,20 Petri dishes,Camera,20 mL of AGAR,Swabs,Two hands(right\left),Assistant(s),Flat surface.
To conduct this experiment; first, we had our assistant thoroughly wash their hands. Next, our assistant washed our right hand with cold tap water while singing "Happy Birthday" twice and rinsed our hand off. After that our partner used a hair dryer to blow our hand dry and then swabbed our hand in a zig zag pattern. Then the partner transferred the bacteria from the swab to the Petri dish. We then did the same thing, only with our left hand and the hand sanitizer.
Starting at day three we took pictures of each test every other day, while charting the percentages of visible bacteria growth in each petri dish. The growth of the bacteria will be monitored for the next 9 days.
To rule out any question of more bacteria possibly being on our dominant hand, Eve will "wash" her left hand (dominant) with hand sanitizer, and Calissa will wash her right hand (dominant) with liquid soap and water.

Results
Two out of three tests show that liquid soap works more effectively than hand sanitizer. Our petri dish with nothing put in it showed a tiny spec of growth at the very end of the nine days, indicating that it would have very little influence on our results. The unwashed hand control shows a lot of bacteria present and consistent growth throughout the trial. When comparing the unwashed hands to the liquid soap and hand sanitizer samples, you can see that while liquid soap works better, both kill bacteria on hands thus preventing the spread of germs and bacteria.

Conclusions/Discussion
We came to the conclusion that hand sanitizer does not work as effectively as liquid hand soap.For the 6 tests we conducted, the results varied a little but we still feel we have come to a solid conclusion. While hand sanitizer did kill germs, it was ineffective unlike the liquid soap. Liquid soap showed less bacteria growth than the hand sanitizer. The unwashed control dishes showed major growth from day one and continued over the period of time we monitored it. Therefore we conclude that it is better to wash your hands with liquid soap and water rather than use hand sanitizer.

Summary Statement
We tried to find out if hand sanitizer kills as much bacteria as liquid soap and if you were given both choices is the the more effective one.

Help Received
Both of our Mothers helped with the lay-out of the board, Katlin Kloepfer assisted with hand washing, and Dr. Christian Heywood gave us some advice.