



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Emily E. Barron	Project Number J2101
Project Title Do Debbie Meyer Green Bags Really Work to Preserve Fruits and Vegetables?	
Objectives/Goals Evaluate Debbie Meyer Green Bags to determine if they are better for storing fruits and vegetables than just using Ziploc plastic bags or no bags, with or without refrigeration.	
Abstract	
Methods/Materials Method 1. Put 2 of each sample into green bags, 2 in plastic and 2 with no bag: With each of the 2 samples leave one on the kitchen counter and then put the other in the refrigerator. 2. Take pictures of fruits and vegetables everyday and observe them. 3. After 14 days swab each fruit and vegetables with a sterile Q-tip and wipe over the agar Petri dishes. 4. Wait for cultures to grow and observe them and take pictures. 5. Decide which type of preserving was the best to use. Materials 6 Debbie Mayer Green Bags 6 Ziploc Double Zipper Multi-Purpose Storage Bags (Gallon size) 12 Ziploc sandwich size bags 9 Paper plates 12 Prepared Petri Dishes with Blood Agar 5 percent Sheep Blood 24 Sterile Q-tips Tri-pod Camera Data Book Refrigerator 12 Tomatoes 12 Bananas 6 Broccoli Crowns 12 Leaves of lettuce	
Results I determined that using Debbie Meyer Green Bag is effective for extending the life of produce. They work better than Ziploc Bags or without a bag.	
Conclusions/Discussion My experimentation proved my hypothesis to be correct. The Green Bags were the best way to preserve the fruits and vegetables. The Green Bags absorbed and removed the ethylene gas which helped preserved the produce. The plastic bag locked in the gases which made the fruits and vegetables decay faster. The fruits and vegetables not in a bag dried out quickly which made them become rubbery and limp. The refrigeration also helped in slowing down the decay rate. Compared to the non-refrigeration, the products with refrigeration looked better in appearance and smelled better. In conclusion, I would recommend buying the Debbie Meyer Green Bag.	
Summary Statement I determined the best way to store fruits and vegetables to retain freshness.	
Help Received Mother assisted in taking pictures.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Celeste M. Carrillo Salado	Project Number J2102
Project Title Got Tears? Get Milk!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this study is to understand what will be the best beverage choice when chili is consumed and creates a burning sensation within the mouth specifically milk, water, or soda to cool down the chili laden tongue.</p> <p>Methods/Materials A short survey from 25 subjects to determine if water, soda or milk will cool off a chili laden tongue the best from a rating scale from 1-5 (one being the best, five being the worst relief). Each subject had two drops of hot sauce placed on their tongue for 10 seconds then to drink each beverage separately, alternating between chili sauce to beverage of choice in the order of water, soda and milk.</p> <p>Results The best beverage choice to cool off a chili laden tongue the following is concluded from the raw data; 12% state water to be the best beverage choice; 36% state soda is the best beverage choice and 68% state milk is the best beverage choice to cool off the chili laden tongue.</p> <p>Conclusions/Discussion The conclusion of this project has proven my hypothesis to be correct: Milk is the best beverage to cool down a chili laden tongue by a significant percentage.</p>	
Summary Statement To determine the best beverage choice when chili is consumed and creates a burning sensation within the mouth from a survey of people.	
Help Received Mother helped assemble display board and proofread paper; classmate helped set up experiment; subjects were used from St. Joseph Academy	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Camila R. Dadabhoy	Project Number J2103
Project Title Got Electrolytes?	
Objectives/Goals A brief overview of this project is to find out which drink has the most electrolytes. The main purpose of this experiment was to see which drink has the most electrolytes and to see if other drinks are better for you than to drink an energy sports drink.	
Abstract Methods/Materials Copper wire, 24 gauge, Wire cutters, Plastic tube from a pen, about one inch, 9-V battery/clip, Wires with clips, Sports drinks, Orange Juice, Distilled water, Measuring cup 1/2- cup capacity, Digital Multimeter. Procedure: 1. Use the wire cutters, cut 2 pieces of copper wire. 2. Use cutters to cut the plastic tube. 3. Wrap one piece of the wire around the tube on one side with 1 inch free. 4. Wrap the other wire on the other end, leaving 1 inch free without any contact between the wires. 5. Attach the battery clip onto the battery. 6. Attach one of the free copper wires on the conductance sensor to the red terminal (+) of the 9-V battery, using clip. 7. Attach the other copper wire from the sensor to the black terminal (-) of the multimeter, using the other clip.	
Results Distilled Water- No Reaction or conductance Sunny D -2nd highest in electrolytes but lots of carbohydrates based on ingredients Power Ade-4th best in electrolytes Gatorade-Almost no calories as the company claims but 3rd in electrolytes V8-Highest in electrolytes also high in carbohydrates, but lowest in calories	
Conclusions/Discussion Surprisingly the V8 had the most electrolytes. I observed that the V8 has the most electrolytes because the vegetables and the number of milligrams of sodium and potassium were more than all the other drinks I tested. It has the most energy and could replace the electrolytes much better than all the other drinks. Note that distilled water had hardly any electrolytes as I had expected, because it is pure. All the water does is to quench our thirst but it has no salts. Juices have relatively high concentration of carbohydrates, which is okay for morning drink, but adds carbs, which is not recommended for rehydrating during exercise. My recommendation is to stick with drinking Gatorade like I had hypothesized because it has the most electrolytes out of the other drinks tested. I would suggest that one could substitute V8 as an energy supplier to our body. After all V8 have the most electrolytes based on my observations and it is the healthiest.	
Summary Statement Which of the following drinks have the highest concentration of electrolytes, Distilled Water, Orange Juice, Gatorade, PowerAde, or V8?	
Help Received Grandfather taught me how to use the multimeter.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Diego A. Denis-Arrue	Project Number J2104
Project Title Microbe Busters	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to find out which cleaner or disinfectant works best to inhibit the growth of bacteria from sour milk.</p> <p>Methods/Materials The method I used for testing was a disc inhibition test in which a filter paper disc was saturated with different cleaners/disinfectants and placed on an agar plate that was swabbed with sour milk bacteria. After 4 days I checked the growth on the plate as well as the zone of inhibition around the disc and measured the clear zone around the paper disc. I determined which disinfectant worked best by the size of the area of inhibition.</p> <p>Results I obtained the greatest average zone of inhibition from Hydrogen peroxide (30mm.), followed by Pine-sol (27.67mm.), and then bleach (22.33). The other set of cleaners/disinfectants had a zone of inhibition below 20mm. in the following order: Green Works (15.67 mm.), vinegar (15.33), and Trader Joe's brand cleaner (10 mm.).</p> <p>Conclusions/Discussion The best disinfectant in my experiment was Hydrogen Peroxide since it had the largest area of clearing. Even though it was the most effective I would not use it as a cleaner at home because it has a bleaching effect on different surfaces. Pine-sol was the cleaner I would use because in my results, it was the commercial product that killed the most bacteria. Out of the two environmentally friendly products that I tested, Green Works gave the best results. In two of the products I used, vinegar and Trader Joe's brand cleaner, there were colonies of bacteria growing in the zone of inhibition which means that the bacteria mutated and developed resistance to these substances.</p>	
Summary Statement In my project I wanted to test which cleaners are most effective at killing sour- milk bacteria.	
Help Received My advisor and mother read my report and results and gave me suggestions on how to write and present my report. My mom helped with the gathering and disposal of the materials I used for this experiment.	



CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

Name(s) Kristy M. Drutman	Project Number J2105
Project Title Hairy Situation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to find out the affects Sodium Laureth Sulfate,a chemical found in common shampoos,has on hair's length,tensile strength,and overall condition.The goal was to find if the accusations that this chemical in regular brands of shampoo,damages hair extensively,is accurate.</p> <p>Methods/Materials After gathering hairstrands from the 16 year old and 4 year old females,the initial condition was observed with a microscope,the initial tensile strength was measured with a apparatus and spring scale,and the initial length was measured with a ruler and cut all the same length.Every other day for 5 days the hair was washed in segregated washing solutions,dried, and measured.In the midpoint of the experiment, hair was again observed for its progressing condition.On the fifth day,the final condition,length,and tensile strength was measured and recorded.</p> <p>Results In the resulting averages it was concluded that the hair from the 16 year old female exposed to the chemical SLS resulted in the hair being broken down to 5.5 cm,along with a tensile strength of 2.1 newtons and the hair from the 4 year old female resulted in a length broken down to 6.28 cm,and a tensile strength of 2.4 newtons.Pantene Pro-V did have the worst affect on both the hair from the 16 year old and 4 year old females,leaving the hair from the 16 year old to decompose to 8.6 cm and the hair from the 4 year old to decrease to 7.5 cm.However,in regards to tensile strength,Pantene left the hair from the 16 year old with an average 2.36 newtons,and hair from the 4 year old with 2.32 newtons, whereas Paul Mitchell left it with a higher decrease of 2.2 newtons and Garnier Fructis left the hair with 2.18 newtons,another higher decrease than Pantene Pro-V.</p> <p>Conclusions/Discussion The main hypothesis that the isolated chemical Sodium Laureth Sulfate would exceed the most damage was supported.The specific hypothesis that PantenePro-V would cause the most damage among all the sulfate shampoos tested was partially supported and partially rejected.It was supported because it did result in the most extensive damage on length,but in terms of tensile strength,Paul Mitchell caused the most damage to the hair from the 16 year old hair,and Garnier Fructis on the hair from the 4 year old.A major factor in manipulation of the resulting length and tensile strength is how the hair from the 16 year old has had much more initial exposure and damage.</p>	
Summary Statement A chemical called Sodium Laureth Sulfate found in common shampoo was investigated on its affects on hair length, tensile strength,and condition.	
Help Received Ms. Fisher provided guidance in using certain tools, processes of experimentation, and lab supplies; Brittany Drutman donated hair for experimentation; Maya Flores donated hair for experimentation; North Carolina Science Department provided Chemical SLS for tests.	



CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

Name(s) Garrett P. Fortner	Project Number J2106
Project Title Peanut: The Invisible Danger	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my science project was to find out the best cleaning product for removing peanut butter from a hard, non-porous surface. My hypothesis was that bleach (3-6% solution of sodium hypochlorite or Clorox) diluted in water will remove 100% of peanut protein from a hard surface when compared to the other cleaning products.</p> <p>Methods/Materials I conducted the experiment by applying peanut butter to a hard surface and wiping the area clean of all visible peanut butter using distilled water, bleach solution (Clorox), alcohol wipes, dishwashing soap, and antibacterial wipes. Next, I used a peanut allergen testing kit to determine if there was still peanut present on the surface. The testing strips provided will pick up the smallest amount of peanut protein present, approximately 5 ppm (parts per million). A positive result means there is peanut protein present. A negative result means there is no peanut protein present. I completed six trials for each cleaning product. In addition to the cleaning products, peanut butter and testing kit supplies, materials included protective gear such as goggles, a mask, gloves and a vest. This was necessary as I am allergic to peanut.</p> <p>Results In the experiment the control trials show that using a cotton cloth alone to remove peanut butter from a non-porous, hard surface gives a positive result; peanut is still present. For the Clorox solution five trials were negative for peanut and one was positive. For distilled water, alcohol wipes, dishwashing soap and water, and antibacterial wipes, all six trials were positive for peanut protein.</p> <p>Conclusions/Discussion The presence of peanut protein on a hard surface when distilled water, alcohol wipes, dishwashing soap, and antibacterial wipes are used to remove the peanut, supports the idea that peanut protein is difficult to get off a hard surface. Clorox with five negative trials supports that this cleaning product is most effective in removing peanut protein. In conclusion, the results support my hypothesis that Clorox solution is the best cleaning product to remove peanut protein from a hard surface. This information is important because it could be shared with schools and other businesses around the world so they can keep their cafeterias and other areas clean. Allergic reactions to peanut can be life threatening so using Clorox to clean will keep students and others safe from an allergic reaction to peanut.</p>	
Summary Statement My project shows that bleach is the best cleaning product to remove peanut protein from a hard, non-porous surface when compared to distilled water, alcohol wipes, dishwashing soap and antibacterial wipes.	
Help Received My mother taught me how to do a criss-cross pattern when collecting a sample. She also helped me graph my data.	



**CALIFORNIA STATE SCIENCE FAIR
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Name(s) Kendra R. Hoffman	Project Number J2107
Project Title Hand Sanitizing vs. Hand Washing	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective in doing this project is to test the effectiveness of using a hand sanitizer versus washing your hands with soap and water.</p> <p>Methods/Materials To carry out this experiment, bacteria samples were taken from 4 different employees at a bank. For the first test (on each subject), I swabbed each of their hands before and after having them use the hand sanitizer, keeping each of the samples in separate Petri dishes. On a different day, with the same 4 employees (each tested separately), I carried out my second test. I swabbed each of their hands once again testing for current bacteria, and then had the 4 employees wash their hands thoroughly with soap and water. After washing with soap and water, I swabbed each of the employee the apostrophe mark s hands again and transferred the bacteria into separate Petri dishes. I then took the bacteria home and cultured it in an incubator. After three days, I brought out the Petri dishes and compared the quantity of bacteria in each.</p> <p>Results All four subjects showed that using a hand sanitizer was more effective than washing their hands with soap and water. In three out of the four subjects, the hand sanitizer was able to reduce the bacteria on their hands by 100%, leaving no bacteria.</p> <p>Conclusions/Discussion In conclusion, my project shows using a hand sanitizer to reduce bacteria on your hands is more effective than washing your hands with soap and water. My hypothesis was correct. The bacterium on each subjectthe apostrophe marks hands was significantly reduced after using the hand sanitizer. Whereas, with the hand-washing method, the bacteria was reduced, but was far less effective.</p>	
Summary Statement My project tests the effectiveness of using a hand sanitizer to reduce bacteria versus washing your hands with soap and water.	
Help Received Science teacher supplied petri dishes and incubator; bank allowed employees to be used as test subjects	



CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

Name(s) Dane F. Holmsky	Project Number J2108
Project Title Does the Fat Content in Dairy Affect Its Taste?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My goal was to determine how the fat content of whole fat, low fat, and nonfat milk and yogurt affects its taste, and how 8th graders and adults can taste the difference between the two. I believed people would be able to taste the difference between whole fat, low fat, and nonfat milk better than yogurt because low fat milk is more watery and whole fat milk is thicker.</p> <p>Methods/Materials I filled 50 milliliter cups with the different styles of milk and yogurt. The dairy products were from Lucerne and Mountain High. Next I gathered 25 adults and eighth graders to taste test the food. Each subject tasted the three styles of yogurt and milk, and tried to identify each as nonfat, low fat or whole fat. The type of dairy products was randomly ordered from subject to subject. Each subject recorded their guesses. Between each taste test of food, subjects rinsed their mouths with water. I analyzed this data to determine how the fat content in dairy products affects their taste.</p> <p>Results My data show that 10 out of 25 subjects could correctly identify nonfat yogurt, 12 out of 25 subjects could correctly identify low fat yogurt, and 14 out of 25 subjects could correctly identify whole fat yogurt. My data also show that 15 out of 25 subjects could identify nonfat milk, 10 out of 25 could identify low fat milk, and 8 out of 25 could correctly identify whole fat milk.</p> <p>Conclusions/Discussion My hypothesis was partly correct, and partly incorrect. I predicted that subjects would more easily identify nonfat milk and yogurt than the low and whole fat products, because it has a less rich taste and more watery texture, and this was partially correct and partially incorrect. It was incorrect because I hypothesized that subjects would identify the nonfat yogurt easiest and that was not the case. My hypothesis was also correct because I hypothesized that the subjects would be able to identify the nonfat milk better than whole and low fat, and this was true. My experiment showed that subjects could not taste the difference between the three very easily. Overall my hypothesis was mostly correct. My experiment is important because people usually think the fat content in dairy products affects its taste. I wanted to find out if people could actually taste the difference. Because people could not taste a huge difference between the products, they can eat healthier by eating nonfat milk and yogurt instead of higher fat products.</p>	
Summary Statement My project is about how the amount of fat in milk and yogurt affects its taste and if subjects can taste the difference.	
Help Received Aunt drove me to buy dairy products at the store.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Thomas W. Howell	Project Number J2109
Project Title How Clean Is Your Countertop?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective in this project was to find out how the five following counter tops rate against each other in terms of bacterial growth after food preparation: Quartz, Formica, Granite, Corian and Ceramic Tile.</p> <p>Methods/Materials In this project I used the following materials; swabs, an incubator, 20 petri dishes, agar, different types of meat, bleach, the five counter tops and a ruler. I first bleached the counter tops and took samples from all of them to serve as a control. I then rubbed meat on the counter tops, wiped it with a sponge like a person might and took another sample from each counter top. I had three trials in this project and I used a different type of meat each time to serve as a control.</p> <p>Results I found that Corian was the dirtiest, followed by Ceramic Tile, Formica, Granite, and Quartz.</p> <p>Conclusions/Discussion I found that the more porous counter tops were the dirtier ones and the more dense and less porous ones were much cleaner.</p>	
Summary Statement My project is about bacterial growth on different kitchen counter top materials.	
Help Received My father helped me design the project and my mother helped design the backboard. Both on them also corrected mistakes on my backboard.	



**CALIFORNIA STATE SCIENCE FAIR
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Name(s) Charlie J. Hughes	Project Number J2110
Project Title Analyzing the Accuracies of Natural vs. Chemical Mosquito Repellents When Mixed with Paint	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my investigation was to find a safe way to repel mosquitoes from laying their eggs in horses' water troughs. I tested this by mixing catnip extract with paint and painting it onto fence rails. I then compared the results to the quotation markHome Defense,the quotation mark a chemical mosquito repellent.</p> <p>Methods/Materials For my experiment, I used plexi-glass sheets, dowel rods, paint, catnip extract, the quotation markHome Defensethe quotation mark repellent, and 250 mosquitoes. I created a Mosquito Containment Apparatus with the plexi-glass sheets, and created fence like replicas from the dowel rods. I then made two mixtures with paint: a catnip mixture and a the quotation markHome Defensethe quotation mark mixture. I then painted the mixtures onto the fences and, comparing them to my control, determined which mixture most efficiently repelled the mosquitoes.</p> <p>Results The results of my experiment showed that my control trials had an average of 28 non-repelled mosquitoes, my the quotation markHome Defensethe quotation mark trials had an average of 11 non-repelled mosquitoes, and my catnip trials had an average of 13 non-repelled mosquitoes.</p> <p>Conclusions/Discussion From my experiment, I learned that both a the quotation markHome Defensethe quotation mark mixture and a catnip mixture can be very effective in repelling mosquitoes when mixed with paint. The catnip mixture, though much safer for use around horses, is not quite as effective as the the quotation markHome Defensethe quotation mark mixture. Both mixtures. however, were very accurate in repelling the mosquitoes in comparison to my control trials.</p>	
Summary Statement I chose to do this project because I wanted to find a safe and effective way to lower the risk or West Nile virus on horses.	
Help Received Rory McAbee, a specialist at the Mosquito Control and Research Laboratory, provided the 250 mosquitoes. Chieko Delgado, a local artist, helped with the layout of my board. Carrie Given and Jewelry Lopez-Lickey, science teachers, supervised my experimental trials.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Mohamed A. Ibrahim	Project Number J2111
Project Title Which One to Use?	
Objectives/Goals My project's objective is: Will different types of antiperspirant gel deodorant affect the growth of bacteria? Does deodorant have an affect on bacteria.	
Abstract	
Methods/Materials MATERIALS: 4 ml droppers; 1 liter of agar; someone's armpit; 20 Petri dishes divided in 4; Gillette antiperspirant gel deodorant; Right Guard antiperspirant gel deodorant; Speed Stick antiperspirant gel deodorant; Large ice chest; Lamp; Red, green, black fine tip Sharpies; Box of Q-tips; Thermometer. PROCEDURE: Number first Petri dishes with a black sharpie, number each section on the side 1 through 4; 2. Do step 1 to the other four Petri dishes; 3. Do step 1 but with red sharpie to another five Petri dishes; 4. Do step 1 but with green sharpie to the other five Petri dishes; 5. On the top of the Petri dishes number them 1 through 5; match all the colors black with black, red with red, and green with green; 6. Place the lamp and the thermometer in the ice chest, and turn the lamp on, to heat the ice chest up to 90 degrees F. 7. Using 1 dropper take 7.5 ml of agar and place it in each section of all the Petri dishes; 8. Take the Q-tips and swab against an armpit for 5 seconds; 9. Swab the bacteria onto the Petri dishes in 1 section; 10. Do step 8 and 9 to the other 44 sections; 11. Put deodorants in droppers (use one dropper for one type of deodorant); 12. Label the droppers; 13. Put .5 of Gillette in each section numbered with the number one; 14. Put .5 of Right Guard in each section numbered with the number 2; 15. Put .5 of Speed Stick in each section numbered with the number 3; 16. Place the Petri dishes into the ice chest; 17. Turn the lamp inside the ice chest on and off every 30 minutes; 18. Turn off the lamp overnight and keep the ice chest tightly closed.	
Results All three types of deodorant reduced the amount of bacteria; however Speed Stick deodorant inhibited bacterial growth the most.	
Conclusions/Discussion My experiment relates to my research, because it proved all three types of antiperspirant deodorant did lessen the amount of the bacteria. The main active ingredient in antiperspirant deodorants compound is aluminum. Aluminum enters through the pores and temporarily blocks the sweat ducts, stopping the flow of sweat from the sudoriferous glands to the surface of the skin.	
Summary Statement My project is about the affect of three different types of deoderant on bacteria.	
Help Received My teacher helped me order the agar(used for culturing bacteria) off the internet.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Kaylina J. Jacuinde	Project Number J2112
Project Title Which Solution Will Preserve a Cut Rose the Longest?	
Abstract Objectives/Goals My objective was to find the best solution to preserve a cut rose. In today's economy we are more frugal on what we spend our money on. The things we buy need to last as long as possible, including a cut rose. Methods/Materials 6 16oz tall jars (recycled from tea bottles), 6 Yellow long stem roses, Measuring cup, Labels - for identifying the solutions, Scissors, Two gallon bucket, Tap water, Lemon Juice (freshly squeezed), 7UP, Flower Food (Floralife Crystal Clear), Bleach, Vinegar. Fill each jar with 1 cup of warm tap water, put a label on each jar, jar 1 put cup of water, jar 2 cup of lemon juice, jar 3 cup of 7UP, jar 4 flower food, jar 5 cup of bleach, jar 6 cup of vinegar, cut stems and put in each jar, document the changes daily. Results Rose with the water only never changed, besides a hint of dryness. Rose with lemon juice opened slightly and now drying up. Rose with 7UP opened, however not fully and it's color is not very bright. Rose with flower food fully opened and it's petals are brightly colored (This turned out to be the best looking rose). Rose with the bleach did the worst, it did not open, instead it shriveled up and it's stem broke in the water. Lastly, the rose with vinegar opened then dried up quickly. Conclusions/Discussion My hypothesis was correct. The rose with the flower food mixture looks the best, it fully opened and looks fresh. The rose with the 7UP solution came in second, it did not fully open. The rose with the water only came in third, it never changed, only a hint of dryness. The rose with the lemon juice solution has dried up. The rose with the vinegar solution has dried up and it's drooping. Lastly, the rose with the bleach solution was the worst, it's dry, shriveled, droopy, and it's stem broke in the water.	
Summary Statement My project is about finding the best solution to preserve a cut rose.	
Help Received Mother helped me glue on my science board.	



**CALIFORNIA STATE SCIENCE FAIR
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Name(s) Joshua P. Kisbye	Project Number J2113
Project Title Comparing the Effectiveness of Toothpaste Brands on Minimizing Tooth Decay	
Objectives/Goals My 1st goal was to find with toothpaste worked best at preventing the decaying the soda caused. My 2nd goal was to find out which soda was the worst for teeth.	
Abstract	
Methods/Materials One (1) Crest cavity protection 6.4 oz tubes of toothpaste One (1) Colgate Whitening 6.4 oz tubes of toothpaste One (1) Aquafresh cavity protection 6.4 oz tubes of tooth paste One (1) Aim cavity protection Four (4) Coca-Cola cans of soda Four (4) Pepsi cans of soda Four (4) Dr. Pepper cans of soda Four (4) A&W Root Beer cans of soda Four (4) Water cans of distilled tap water from the sink Five (5) Oral-B kid#s toothbrushes Two (2) 42 by 23 centimeters metal pans Twenty (20) Wal Mart 16 oz clear plastic cups One (1) pair of commercial tongs One (1) E-Bal triple beam balance scale Twenty (20) Sunnyside Farms grade AA chicken eggs	
Results Crest was the best on average and worked best against Coca-Cola, but was least effective against water. Aquafresh was 2nd best on average and worked best against Pepsi, but was least effective against water. Colagte was 2nd to worst and worked best against Pepsi, but was least effective against Dr. Pepper. Aim was the worst and worked best against A&W Root Beer, but was least effective against water.	
Conclusions/Discussion My hypothesis for toothpaste vs. soda was Auqafresh would work best because of the fluoride and other anti-bacterial ingredients. Then Colgate, 3rd Crest, and finally, Aim in that order from best to worst. I based this all on anti-bacterial ingredients. The only part I got correct was I predicted Aim would be the least effective and it was the least effective (210.5544 on average). Another part I got wrong was I predicted Aquafresh would be best, but Crest was the best (253.4844 on average), then Aquafresh (250.558). Colgate came in 3rd instead of 2nd (246.0125). An important observasion I made was Colgate	
Summary Statement I am experimenting to find out which soda prevents tooth decay the best and which one is not as effective.	
Help Received My advisor helped revise my board.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Hafsah A. Lakhany	Project Number J2114
Project Title Your Carpet: The Unexpected Culprit	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of my experiment was to test different types of carpets and analyze which one would arrest the most bacterial growth. I believe that the antimicrobial carpet will work best in inhibiting the growth of bacteria, followed by the stain protection carpet which will work second best in inhibiting the growth of bacteria. My control carpet will be least effective in arresting the growth of bacteria.</p> <p>Methods/Materials In order to conduct my experiment, I applied <i>S. marcescens</i> and <i>E. coli</i> bacteria onto the carpet samples and incubated them for 48 hours. Next, I ran sterile swabs on the carpets, and applied them onto Petri dishes which were incubated as well. I then washed the carpet samples, streaked the sterile swab applicators onto the carpets, and applied them onto separate Petri dishes.</p> <p>Results For my overall result, I found that the antimicrobial carpet was most effective in inhibiting the growth of bacteria, which proved the first part of my hypothesis correct. I also found that the control carpet was more resistant to the bacteria than the stain protection sample, thus proving the second part of my hypothesis incorrect.</p> <p>Conclusions/Discussion After conducting my experiment, I found that antimicrobial carpets do work best in stopping the growth and spread of bacteria. This is due to the presence of silver and zinc ions, which are embedded in the fibers, that have natural antimicrobial qualities. However, the stain protection carpet sample did not stop the growth of bacteria, but did the opposite. This maybe due to the topical treatments that are applied to its surface to prevent stains. The control carpet which did not have any kind of treatment on its surface did not prove to have the most bacteria present.</p>	
Summary Statement My experiment was done to check the efficiency of antimicrobial carpets in stopping the growth and spread of bacteria on its surface.	
Help Received Mom helped me order my materials; Hallmark and Magic Carpet Stores ordered my carpet samples; my pediatrician allowed me to dispose of the biohazard materials in his facility.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Janelle Lew	Project Number J2115
Project Title Bagged Lettuce: Convenience or Killer?	
Abstract Objectives/Goals Life today is very fast paced. To keep up with this, our world is full of modern conveniences. One popular time saver is bagged lettuce. The lettuce industry promotes their "triple washed salads" as safe and RTE (ready to eat). This convenience, however, has been linked to many food borne illness outbreaks. In my experiment, I found that bagged lettuce products are not always safe to consume straight out of the bag. Methods/Materials Ten different bagged lettuce products were used to gather information. Each sample was tested for the presence of bacteria both before and after washing of the lettuce. Each sample was tested for the growth of general bacteria on LB agar, as well as the growth of specific E. Coli bacteria on MacConkey agar. Results All of the lettuce products showed heavy growth of bacteria on both LB and MacConkey agar before any washing was done. The only exception was Ready Pac Santa Barbara which had moderate growth on LB agar. Seventy-five percent of the samples showed a decrease in bacterial growth after washing was done. The MacConkey agar plates showed the specific growth of E. Coli on all ten lettuce samples before washing. Nine out of the ten products showed a decrease in E. Coli after washing. The four spinach products showed a similar result and seventy-five percent of these samples showed no growth of E. Coli after washing. Conclusions/Discussion My data showed that lettuce products eaten straight out of the bag may not be safe. The significance of these findings can have a positive effect on reducing any future outbreaks from the RTE industry. It is a fast-growing industry and can make a busy schedule a little easier. It, however, only takes a few extra minutes to wash a bag of lettuce and the benefits can be significant. I hope the results from my experiment will encourage everyone to take an extra step in the consumption of RTE products and thus decrease the chances of any future outbreaks. The simple act of first washing the lettuce can make bagged lettuce truly convenient and safe.	
Summary Statement My project tests the safety of consuming lettuce products straight out of the bag.	
Help Received My mother bought the lettuce products and ordered the agar plates. I also used the incubator at my school.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Kyle N. Markfield	Project Number J2116
Project Title The Toxic and Non-Toxic Cleaning Wars	
Abstract Objectives/Goals The purpose of this experiment was to determine if non-toxic cleaners work as well, or are more effective than toxic cleaners. Methods/Materials Five small circles of blotter paper were placed in each cleaning sample for 1 hour. The toxic cleaning sample was Lysol, and the non-toxic cleaning samples were water, baking soda, lemon juice, hydrogen peroxide and vinegar. Prepared sterile agar Petri dishes were then inoculated with bacteria samples taken from the floor of my house. I then placed a soaked dot sample in the middle of each of my Petri dishes and labeled each dish with the name of the cleaner the dot soaked in. I observed and measured the kill zone areas of each of the samples over a seven day period. Results The Petri dishes with the toxic cleaner Lysol had an average kill zone radius of 2.8cm and an area of 24.62 sq. cm. All of the Petri dishes with water had no kill zone areas. The Lemon Juice Petri dishes had an average radius of 1cm and a kill zone area of 3.14sq. cm. Vinegar had an average kill zone radius of 2.1 and its area was 13.85 sq. cm. Both Hydrogen Peroxide and Baking Soda had an average kill zone radius of 4.2cm and an area of 55.39 sq. cm. Conclusions/Discussion My conclusion is that the non-toxic cleaners Hydrogen Peroxide and Baking Soda actually performed better than the toxic cleaner Lysol. My results lead me to believe that there are better cleaning agents than the many dangerous toxic cleaners sold in our stores. Non-toxic cleaners do not hurt our environment, and after doing this experiment I learned that some also clean and kill bacteria just as well as toxic cleaners.	
Summary Statement My project was to prove that some non-toxic cleaners work just as well as the toxic cleaners that continue to harm us and our environment.	
Help Received Mother helped me insert pictures into charts, and my father helped me create the graphs on the computer.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Jenna R. McMane	Project Number J2117
Project Title Consistency Counts: Comparing the Results of Blood Glucose Meters	
Abstract Objectives/Goals The objective of this project is to determine how consistent blood glucose meters are when testing a range of blood glucose levels. Methods/Materials I tested my blood glucose ten times, on eleven different meters each time. I compared the results on the meters, and calculated the range and standard deviation of the data. I then calculated how much insulin would be needed to correct my blood glucose at each reading. Results I found that the higher the blood glucose readings were, the less consistent the meter readings were. The largest range of blood glucose results was 95 mg/dL. This result occurred when my blood glucose was the highest. The smallest range, 13 mg/dL, occurred on one of the tests when my blood glucose was the lowest. Conclusions/Discussion I check my blood glucose eight to ten times a day to manage my Type 1 Diabetes. It is important for me to have accurate blood glucose readings so that I know how much to compensate for a high or low glucose level. Overall, the meters were fairly consistent, but several of the inconsistent readings would have caused me to take either too much or too little insulin. This can have serious effects on my health.	
Summary Statement This project tests the consistency of blood glucose meters in a person with Type 1 Diabetes.	
Help Received My mother supervised my blood glucose testing and helped assemble my board.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Ali B. Ozgur	Project Number J2118
Project Title Healing Power: Past or Present	
Abstract Objectives/Goals My objective is to determine whether honey or Neosporin have a greater impact on the reduction of bacterial growth. Methods/Materials Materials: 15 petri dishes divided into thirds, 24 oz. bottle of grade A clover honey, 1 liter of agar, tube of Neosporin Original, 45 cotton swabs, bulb thermometer, medium size Styrofoam cooler, desk lamp, and a 15-watt light bulb. Method: I conducted three trials of five samples each. I swabbed bacteria onto the agar in my Petri dishes. I then put a drop of honey in one of the sections in each Petri dish and some Neosporin in a different section in each Petri dish. After three days I recorded the results, measuring the amount of bacterial growth within a 4 mm diameter in each of the substances. Results I found that within a 4 mm diameter, at the thickest section of both the honey and Neosporin, they both had no bacterial growth. Conclusions/Discussion It turned out that both, Neosporin and honey, had no bacterial growth and did a good job preventing bacteria from growing when measured at their thickest parts.	
Summary Statement Determining whether honey or Neosporin have a greater impact on the reduction of bacterial growth.	
Help Received Mother helped with gluing on display board.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Olivia D. Partone	Project Number J2119
Project Title Bacteria: Don't Love It, but Leave It!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine which cleaner I should use to clean my bathroom based on which would kill the most bacteria.</p> <p>Methods/Materials The materials included: petri dishes, agar (a gelatinous material derived from seaweed), sterial swabs, blotting paper and household cleaners.</p> <p>The petri dishes were prepared with agar to make an environment for bacteria growth. The sterile swabs were used to collect bacteria samples from various surfaces in my bathroom. The bacteria was left in the prepared dishes to allow the bacteria to multiply. Three household cleaners were sprayed onto the blotting papers, which made them sensitivity squares. The squares were placed on the different bacteria colonies to see which reduced the most bacteria and prevented growth most effectively.</p> <p>Results Cleaners with alcohol actually helped the bacteria to grow. An overuse of cleaners and disinfectants can actually inhibit our ability to develop anti-bodies to the most harmful bacteria. While all the household cleaners reduced the size of their respective bacteria colonies, only one reduced the bacteria in the whole dish.</p> <p>Conclusions/Discussion The results helped me to decide on one cleaner, Lysol All-Purpose with Belach, as the best to use on my bathroom. The results proved my hypothesis that a good cleaner would significantly reduce the bacteria present. My project was about the best way to kill bathroom bacteria, but showed me how to life peacefully with non-harmful bacteria and kill only the harmful germs lurking.</p>	
Summary Statement My project is meant to identify the best household cleaner to reduce the bacteria in my bathroom.	
Help Received My mother helped me take pictures and use the computer for research. My dad helped me handle the chemicals.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Alaina R. Petlewski	Project Number J2120
Project Title Home Is Where the Heartburn Ends? Home Remedies for Acid Indigestion	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine which of eight home remedies tested would reduce the acidity of vinegar, a substitute for stomach acid, the most effectively, and would that remedy work as well or better than a known antacid- Mylanta Ultimate Strength. I believed the baking soda and water would be the most effective.</p> <p>Methods/Materials Initial pH readings of 350 ml of white vinegar were taken with a pH meter. The recommended amount of ginger, potato, apple, peppermint, soda crackers, mustard, baking soda & water, milkshake and Mylanta, was added to the vinegar. The pH of the solutions was measured at timed intervals up to one hour.</p> <p>Results In both trials, the baking soda and water reduced the acidity of the vinegar the most effectively, even better than the Mylanta Ultimate Strength. However, if you have high blood pressure or are on a salt restricted diet, baking soda is not recommended. In this situation, the remedy to reduce the acidity the most was the milkshake. In the case that you are lactose intolerant and cannot consume baking soda, the raw potato was third most effective in reducing the acidity of the vinegar.</p> <p>Conclusions/Discussion My conclusion is that the baking soda and water reduced the acidity of the vinegar the most over the hour long period, working even better than the Mylanta. The next most effective home remedies were the milkshake and then the potato. My hypothesis was proven correct- the baking soda and water reduced the acidity of the vinegar the most effectively. The next most effective home remedy was the milkshake.</p>	
Summary Statement My project determined which of eight home remedies reduced the acidity of vinegar the most effectively, and if the best home remedy would work as well as, or better than Mylanta Ultimate Strength.	
Help Received Mom- helped with spread sheets and graphs, board alignment, and testing	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Mitzi H. Pierson	Project Number J2121
Project Title The Dirt on Soap	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to find out if antibacterial soap works more effectively at eliminating bacteria than non-antibacterial soap.</p> <p>Methods/Materials Using both the antibacterial and non-antibacterial soaps, I grew bacteria on sterilized petri-dishes with agar. The materials I used were: antibacterial hand soap, non-antibacterial hand soap, nutrient broth (bacteria food), agar powder (beef extract & gelatin growth medium), petri-dishes, autoclave (pressure-cooker), laminar flow hood, beef broth, latex gloves, incubator, rubbing alcohol, water, beakers, eye-droppers, pipette, spray bottle, and test tubes.</p> <p>Results My results showed that there was no difference in the effect of eliminating bacteria between antibacterial and non-antibacterial handsoaps.</p> <p>Conclusions/Discussion My results showed that antibacterial and non-antibacterial soaps had an equal effect. I discovered that "antibacteria" is only a name that makes soaps sell better, because in reality, antibacterial soaps do not work any better than non-antibacterial soaps at eliminating bacteria.</p>	
Summary Statement The main idea of my project was to determine if antibacterial soap really was any better than regular soap.	
Help Received Mr. Potter assisted and supervised my project.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Mike M. Pilegard	Project Number J2122
Project Title Is It Easy Being "Green"? Comparing "Green" and Conventional Cleaners on Environmental Impact, Quality, and Cost	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine if "green" cleaning products are better for the environment, your budget and your household cleanliness than conventional cleaners. My hypothesis states, the "green" cleaners will be better for your environment, but will cost more and not work as well as conventional cleaners.</p> <p>Methods/Materials I will be testing the environmental impact of fumes, runoff, drywell leached soil, and grey irrigation water that have been contaminated with household cleaners. I will test indoor air pollution by various cleaners' fumes by putting cleaners onto a cup lid and placing it onto a cup with mealworms and recording the death rate. I will test soil pollution around a drywell by pouring diluted household cleaners into the soil with earthworms and record death rate and reactivity of the worms. I will test grey water polluted with cleaners by replicating a grey water irrigation system, then irrigating bean seeds placed in Ziplock bags with papertowels. Germination rate will be recorded. Runoff will be tested by recording the pH changes of river water samples, using a pH indicator, when diluted cleaners are added. The quality of the cleaners will be tested by using auto oil, dirt, berry stains, dried muddy water and spaghetti sauce applied to surfaces such as white tile and glass. All experiments will be conducted 10 times for each cleaner and a control when needed. Cost of the products will be compared.</p> <p>Results "Green" cleaners caused the least amount of change in green bean germination rate and earthworm reactivity, tied with the conventional cleaners on the indoor air pollution, and caused the most amount of change in the pH of river water. Conventional cleaners cleaned the best and cost less.</p> <p>Conclusions/Discussion My project was to test off the shelf cleaning products. Many consumers want an environmentally safe, high quality and inexpensive cleaning product. When consumers see "green" or environmentally safe they expect that. I tested this expectation on many environments that are impacted by the disposal and use of cleaning products. I also tested quality on typical stains and surfaces and explored cost. My hypothesis was correct. "Green" cleaners are better for the environment. Conventional cleaners are better in quality and average cost. However, consumers need to know the "green" cleaners did affect the environment, just not as much as the conventional cleaners.</p>	
Summary Statement My project focuses on when a consumer looks at a so called "green" cleaner, they want to know if this cleaner fits this claim, in a way that is better than conventional cleaners regarding the environment and including cost and quality.	
Help Received My dad drilled holes into the bucket. My mom helped me type, tape and cut. Parents paid for everything and supervised.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Ariana N. Rupp	Project Number J2123
Project Title The Effect of Mascara on Contact Lens Disinfection	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine if contact lens disinfecting solutions will work as well if mascara comes in contact with the solutions during use. To evaluate the activities of three different disinfecting solutions against two bacterial skin isolates in the presence of two different mascara products.</p> <p>Methods/Materials For each solution and mascara, two different bacteria were spread onto the surfaces of separate agar plates. Metal penicylinders were then placed on the plates and were filled with either contact lens disinfecting solution, contact lens disinfecting solution containing 0.1 mg/mL mascara or 0.1 mg/mL mascara (control). Plates were incubated until bacterial lawns were formed. Clearing around the penicylinders indicated that disinfecting solutions prevented growth. The clearing produced circular zones which could then be measured. Results for disinfecting solutions with and without mascara could then be compared to each other and to results for mascara alone.</p> <p>Results Test results indicated that both mascaras decreased the activities of the disinfecting solutions that contained either 0.0001% polyhexamethylene biguanide or 0.001% polyquaternium-1 and 0.0005% myristaidiopropyl dimethylamine. Test results indicated that both mascaras did not have an effect on the disinfecting solution containing 3% hydrogen peroxide. Differences could be seen among the disinfecting solutions and differences were seen when testing the 2 bacteria. The hydrogen peroxide disinfecting solution displayed the greatest amount of activity against both bacteria.</p> <p>Conclusions/Discussion Mascara can adversely affect some contact lens disinfecting solutions. Therefore, users should take special care to rub and rinse their lenses to remove any traces of mascara.</p>	
Summary Statement The project examines the effect of mascara on contact lens disinfection.	
Help Received My teacher (Mrs. Harbison) and my parents provided guidance.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Kenna R. Sandberg	Project Number J2124
Project Title External Orange Damage	
Abstract Objectives/Goals The objective is to determine the critical freeze period for an orange. The goal is to identify the material that prevents an orange from freezing for the critical freeze period. Methods/Materials Twenty-four oranges are placed in the freezer for 1, 2, 3, 4, 5, 6, 7, and 8 hours. Every hour remove three orange out of the freezer and place them in a square, plastic container exposed to ambient temperature. Record which orange degrades first, measure and document amount of degradation. Once the critical freeze period has been identified, perform experiment two. Place six oranges in Bubble Wrap, Plastic Bag, Paper Bag, Cardboard Box, and Wax coated oranges in the freezer for the critical freeze period. Once the oranges have been frozen for the amount of time remove the oranges in the freezer, remove the wrappings, and place them in a square, plastic container exposed to ambient temperature. Based on the six insulating materials I used in this test procedure, I will monitor and record each material used for protecting against frost damage. 1st observance of degradation being the least amount of frost protection, six being associated with the material that provided the most amount of protection. At this point in my test procedure, I will categorize best to worst protective material in the critical freeze period. Results The critical freeze period is eight hours with an average mold growth of 5.33cm. The best protective material for an orange in the critical freeze period is Bubble Wrap with an average mold growth of 0.25cm. Conclusions/Discussion My first conclusion is that the critical freeze period is eight hours because the orange has more time to freeze than the lower hours. My second conclusion is that the protective material of an orange for the critical freeze period is Bubble Wrap rather than the other materials because the bubble wrap has small chambers of air incorporathed into four layers of plastic to protect the orange.	
Summary Statement My project is about the critical freeze period and the material that prevents orange damage for the amount of freeze time.	
Help Received Mother helped with board; Teacher reviewed work.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Jacquelyn D. Shoults	Project Number J2125
Project Title It's Not Easy Being Green	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I predict that most people don't know what makes and removes the green that builds up in a swimmer's hair, because according to my research, copper creates that green and requires certain unusual chemicals such as special shampoo, vinegar or tomato juice to get rid of it.</p> <p>Methods/Materials - 1/4 liter JSerra pool water - 100 drops Leslie's Pool Test Kit Sulfuric Acid- 50ml Muratic Acid &#8232;- 100ml Malibu Makeover Chemicals - 1/4 liter pool water from JSerra swimming pool- 24 Q-Tips&#8232;- 100ml Tomato Juice/Paste - 100ml Lemon Juice - 24 Cotton balls &#8232;- 100ml White Vinegar - 25ml Salt - 24 1# x 1/2# towel strips&#8232;- Tap water, unlimited/running water - 100ml Leslie's Pool Copper Algacide - 50ml Malibu Copper Sulfate &#8232;- 2 inches pure copper wire &#8232;</p> <p>Results The Malibu Wellness chemical showed the lowest presence of copper with 50 ppm (parts per million) using the test strips. Visual inspection was also completed looking for the hair with the least presence of copper (blue). From best to worst, the following was observed, and again showing the Malibu Wellness chemical removed the most copper: #1 Malibu, #2 Vinegar, #3 Lemon, #4 Tomato, #5 Salt, #6 Tap.&#8232;</p> <p>Conclusions/Discussion Copper can turn hair green/blue. Malibu Makeover Shampoo was the chemical that removed the most copper, followed by vinegar, tomato juice and lemon juice. This experiment also showed that most people (92%) did not know that copper in pool water turns hair green. Surprisingly, many people (35%) did know the best way to remove it is special shampoo.</p>	
Summary Statement Copper can turn hair green/blue, Malibu Makeover Shampoo was the chemical that removed the most copper, and this experiment also showed that most people (92%) did not know that copper in pool water turns hair green.	
Help Received Malibu Makeover Shampoo supplied products; Family helped purchase items/using chemicals	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Bailey K. VanOmmeren	Project Number J2126
Project Title Got Mold?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In my project, I wanted to find out which kind of primer is the best to prevent mold on painted drywall and if a commercial mold prevention paint additive is an effective and worthwhile way of preventing mold growth.</p> <p>Methods/Materials I had five combinations of paint and mold prevention additives with three of each including: oil-based primer, oil-based primer with a mold prevention additive, water-based primer, water-based primer with a mold prevention additive, and then no primer. I then painted all fifteen samples over with the same kind of water-based finish coat. Next, all of the samples were placed in a home-made mold incubator that was kept warm by a lamp and had standing water in the bottom.</p> <p>Almost all of the samples had large mold colonies growing on their unpainted side by the end of the first week. However, after about three weeks still no mold had grown on the fronts. So, in order to obtain accurate results, I placed one of each sample in a plastic bag with a piece of bread on it. After four days, mold grew on those samples. I then measured the depth of the mold on the bread, which varied from 1mm to 10mm.</p> <p>Results In the end, I discovered that in order from most effective to least in preventing mold the order was: oil-based primer with mold prevention, water-based primer with mold prevention, oil based primer, no primer, and lastly, water based primer. In fact, the sample with the water based primer developed ten times as much mold as the sample with oil-based primer and mold prevention.</p> <p>Conclusions/Discussion In the end, I discovered that the best way to prevent mold is to keep drywall painted and dry. However, if water exposure is unpreventable, then the best thing to do is use an oil-based primer with a mold prevention paint additive.</p>	
Summary Statement I wanted to find the best way to prevent mold growth on drywall.	
Help Received Father provided some advice.	



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Crista R. Walters	Project Number J2127
Project Title Is Green Clean or Mean?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project was to investigate if natural environmentally friendly cleaning products are more effective and longer lasting for killing bacteria than conventional cleaning products. The natural products tested were Dawn Dish Detergent, Green Works Natural All Purpose Cleaner Spray, and Seventh Generation Natural All-Purpose Cleaner Spray. The conventional products tested were Clorox Regular Bleach, Lysol Antibacterial Kitchen Cleaner #Citrus# Spray, and 409 Antibacterial Kitchen All Purpose Cleaner #Lemon Fresh# Spray.</p> <p>Methods/Materials Medium preparation: A 2x4ft hard plastic sheet simulated a kitchen counter top (SKCT) and was used for 3 weeks. Divide into 6 sections labeled Soap & Water (SW), Green Works (GW), Seventh Generation (7th Gen), Bleach (B), 409, and Lysol (L). Contaminate the SKCT with liquid from a package of chicken. For each Stage, the sections were cleaned with the product and 6 blood agar dishes were planted with medium from each section and incubated between 90-100 degrees. Bacterial colonies were counted and recorded. Stage I - Control; Stage II - 1st cleaning; Stage III - No cleaning; Stage IV - 2nd cleaning; Stage V - 3rd cleaning.</p> <p>Results Stage I: Bacterial colony counts were high in all products showing contamination throughout all sections. Stage II: 1st cleaning - Bacterial colony counts were <7 in all blood agar dishes. Stage III: 32 hrs later SW had 269, B had 68, 7th Gen had 31, L had 25, 409 had 10 and GW had 8 bacterial colonies cultured. Stage IV: 2nd cleaning # B had 22, 7th Gen had 13, GW 409 and L had 3 each and SW had 2 Bacterial colonies cultured. Stage V: 3rd cleaning # L had 57, B had 28, 7th Gen had 15, GW had 3, SW had 2 bacterial colonies and 409 had 1 colony.</p> <p>Conclusions/Discussion It was thought that conventional products would outperform and be more effective than natural products. This is not what happened. Green Works and 409 were the best and performed about equally. Soap and Water was 2nd, Seventh Generation 3rd, Lysol 4th, and Bleach 5th. The study might be redesigned to drop bacteria onto empty plates containing only the various solutions and then see if the bacteria could grow. Another study could investigate different concentrations of bleach to see at what concentration bacterial growth is unaffected.</p>	
Summary Statement The goal of this project was to investigate if natural environmentally friendly cleaning products are more effective and longer lasting for killing bacteria than conventional cleaning products.	
Help Received Blood agar dishes provided by Dr. Migler at St. John's Hospital; Mother helped proof read and format report.	