



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kyle T. Aidukas	Project Number J1801
Project Title Containers' Effects on Banana Ripening	
Abstract Objectives/Goals The purpose of this experiment is to determine which type of container will keep a banana freshest the longest. The banana peel's color would indicate ripeness. The hypothesis was that if a banana is in an air-tight container, then the banana ripening will slow. Methods/Materials Research shows that ethylene is responsible for the ripening of fruits. My research also said that CO ₂ is a blocker of the production of ethylene. In my study, I used a product called #Extralife# that has potassium permanganate in it, which is supposed to absorb ethylene, and put it in one of the closed Ziploc bags. I compared the ripening of 18 bananas, four of which were control bananas, in each of the trials. I also recorded the stage of ripeness over the course of seven days. Bananas were randomly placed in five different container types, which were further divided into fourteen experiments. They were photographed and evaluated twice a day for Trial 1 and for Trial II pictures were only taken in the morning. The ripeness was recorded every day. The independent variable was container types and the dependent variable was the speed of ripening as determined by the Chiquita Banana Ripeness Stage Scale. Results The major finding was that bananas in a closed, airtight container did not ripen as quickly as bananas exposed to air. The bananas in the closed Sterilite container, the closed Sterilite with the CO ₂ , and Ziploc bag with the potassium permanganate product in it kept those bananas at Stage 3 of ripeness, which is a peel more green than yellow. The bananas with Stage 7 of ripeness, which is a peel that is yellow flecked with brown, were a control, a small closed paper bag, a large paper bag with holes, and a Rubbermaid container with vent holes. In Trial II, weights were recorded before and after the trial and they showed a correlation between weight loss and ripeness stage. The greenest bananas lost the least weight and the ripest bananas lost the most weight. Conclusions/Discussion Both Trials supported my hypothesis that a closed, air-tight container will keep bananas from ripening quickly.	
Summary Statement The purpose of this experiment is to determine which type of container will keep a banana freshest the longest.	
Help Received Mother helped type report and Father helped with display.	



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Eliya Baron-Lopez; Kristina Hargrave	Project Number J1802
Project Title Germs and Bacteria	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our project is about germs and bacteria. We were trying to see what brand of soap cleans hands the best. The soaps we used were Method, Soft Soap, Germ-X hand sanitizer and Dove. Our hypothesis was that Dove cleaned hands the best because it sells lots of different types of soaps.</p> <p>Methods/Materials</p> <ol style="list-style-type: none">1. We went to random.org to help randomly choose four people out of a hundred kids at our school.2. We tested each soap 4x's for four days.3. We tested this by taking the four random kids and giving them each two agar plates. One plate they touched before they wash their hands and the other plate they touched after they washed their hands. Each kid was assigned a soap or hand sanitizer. We labeled our plates B (before), A (after), the time, the date, and with an assigned subject number4. We tried to make each hand washing the same. They did the following: put there hands under running water for ten seconds, given one squirt of their assigned soap, scrubbed their hands for fifteen seconds, rinsed their hands under running water again for thirteen seconds, and dried their hands with a paper towel for fifteen seconds. (We had some people help us do the timing and make sure our subjects did not touch anything before they touched their second agar plate.)5. When our testers touched their agar plate they only used four fingers (no thumb). We put all our agar plates in an incubator.6. We were able to measure the amount of bacteria on the agar plates by attaching a transparent graph to our pictures of our agar plates. We used a marker to place dots on the areas of growth covered by the graph.7. We counted the dots and subtracted the after from the before. We then recorded the results on a table. We then calculated the averages. <p>Results Our results disappointed us because we were wrong with our hypothesis. Actually Dove did the worst at cleaning the germs off hands.</p> <p>Conclusions/Discussion We thought the opposite of reality. Method surprisingly did better than the rest of the soaps. Soft Soap was in second place and Germ-X was in third.</p>	
Summary Statement We were trying to see what brand of soap cleans the most germs off your hands.	
Help Received Mr. Spedding help with supplies, editing, photography and ideas; Community Hospital of the Monterey Peninsula with supplies; Mary Welsh guided us with compiling data	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Deepika C. Bodapati	Project Number J1803
Project Title Building an Endotoxin Detection Home Test Kit	
Objectives/Goals Goal 1-Find a filter paper that can be used for a dipstick test Goal 2-Make a color graduating test so that if there is more endotoxin, the shade of yellow would be darker and if there is less endotoxin, then the shade of yellow would be lighter Goal 3-The test must be quick and easy to use Goal 4-The test must have a negative control embedded into the paper so not to show a false positive Goal 5-The test must be able to work at different temperatures Goal 6-The test must be able to work in the real world, i.e with ready-to-eat salad	
Abstract Methods/Materials endotoxin (dead E. coli and Salmonella) Limulus Amebocyte Lysate (LAL) Chromogenic Assay Deionized water Pyrogen-free test tubes Serological pipettes Micro-pipettors Micro-pipette tips Reagent water 5 different types of filter paper Cambrex LAL test kit 2 different brands of Ready To Eat Salad	
Results The test (filter paper) did turn yellow in the presence of endotoxin. The color change also corresponded to the amount of endotoxin detected. When there was more endotoxin detected, the yellow color change was darker, when there was less endotoxin detected the color change was lighter.	
Conclusions/Discussion I was successful in building a prototype that can be used at home to detect endotoxin (presence of Salmonella, E.coli) . Furthermore, I did meet all of my goals.	
Summary Statement I have built a prototype test kit that can be used at home to test for the presence of endotoxin (Salmonella, E.coli) in Ready To Eat Salad	
Help Received Used Lab Equipment at Schmahl Science Workshop	



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Charles P. Boyd	Project Number J1804
Project Title Antibiotics: Natural vs. Pharmaceutical	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine if some natural antibiotics are as effective as synthetically or pharmaceutically produced antibiotics in either arresting the growth of bacteria or killing bacteria that cause disease or infection in the human body.</p> <p>Methods/Materials In conducting two different experiments, the same natural antibiotics (Grapefruit Seed Extract, Olive Leaf Extract, Tea Tree Oil, Garlic, Oil of Oregano, and Raw Unfiltered Honey) and the same pharmaceutical antibiotics (Amoxicillin, Erythromycin, and Tetracycline) were used. Both experiments also used the following bacteria: Serratia Marcescens, Streptococcus Lactis and E-Coli. In Experiment I, sterile paper disks soaked in 6 natural and 3 pharmaceutical antibiotics were applied to agar surfaces that had been inoculated with 3 different kinds of bacteria 12 hours earlier. In Experiment II, sterile paper disks soaked in all 9 antibiotics were immediately applied to agar surfaces that had just been inoculated with 3 different kinds of bacteria. In both experiments, a micrometer was used to measure any bactericidal action around the disks after 24 and 48 hours.</p> <p>Results In Experiment I, Amoxicillin inhibited the growth of all 3 bacteria the most successfully, followed by Tea Tree Oil, Grapefruit Seed Oil, Tetracycline, and Oil of Oregano. In Experiment II, all 9 antibiotics were more successful at inhibiting the growth of all 3 bacteria when compared to Experiment I. Tea Tree Oil was the most successful antibiotic at inhibiting the growth of all 3 bacteria in Experiment II, followed by Amoxicillin, Tetracycline, Erythromycin, Garlic, and Oil of Oregano.</p> <p>Conclusions/Discussion The results of both experiments suggest that some natural antibiotics are as effective as pharmaceutically produced antibiotics in inhibiting the growth of bacteria. Unlike pharmaceutically produced antibiotics, drug resistance does not develop against naturally occurring antibiotics. It is clear that the medical and scientific communities need to continue to conduct research on the bactericidal efficiency of herbs and other natural substances as viable alternatives to pharmaceutical antibiotics, so that their use could potentially help reduce the rise of drug-resistant bacteria in humans.</p>	
Summary Statement My project tests the bactericidal efficiency of six natural and three pharmaceutical antibiotics with cultures of Serratia Marcescens, Streptococcus Lactis, and Escherichia Coli (E-Coli)	
Help Received Dr. Roy Grekin and Dr. Dale Ritzo prescribed the pharmaceutical antibiotics; Susan Bachus provided the bacteria necessary for conducting the experiments; my mother helped assemble the materials for my project.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Philip Caine	Project Number J1805
Project Title Are Herbal Remedies as Effective as Commonly Prescribed Antibiotics against Bacteria?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine if dandelion roots and/or peppermint leaves are as effective in fighting E.coli as erythromycin and penicillin. I believed that the man-made antibiotics would be more effective.</p> <p>Methods/Materials I put E. coli in ten Petri dishes(two for each independent variable)and incubated them for 48 hours to allow the bacteria to grow. I recorded my results and then added the antibiotics and herbs. The control was distilled water. All test samples were incubated for 48 hours. To get the final results bacterial colonies were counted, measured, averaged and recorded.</p> <p>Results The average size of a bacterial colony before inoculation for dandelion root was 23 mm, for peppermint 35 mm, for erythromycin 21 mm, for penicillin 16 mm and for distilled water 35 mm. After inoculation the average colony size for dandelion root was 5 mm, for peppermint 2 mm, for erythromycin 2 mm, for penicillin 5 mm, and for distilled water 4 mm. The greatest difference in size of bacterial colony before and after inoculation was with the peppermint test sample.</p> <p>Conclusions/Discussion I think my hypothesis was incorrect because peppermint is proven to help inner stomach and intestine problems. Therefore it would work better against E. coli. The man-made antibiotics are not necessarily proven to cure those specific problems. Peppermint worked the best.</p>	
Summary Statement My project was finding the most effective treatment for killing E. coli , whether a natural or man-made remedy.	
Help Received Dad helped wire incubator. Mom held test samples while I measured results.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Casey M. Campos	Project Number J1806
Project Title Can Absorbent Materials Help Preserve Produce?	
Abstract Objectives/Goals The objective of my project was to determine if absorbent materials could help preserve produce. Methods/Materials Zeolite granules, Zeolite rocks, and pine pellets (1/4 cup each) were individually combined with produce in a plastic bag. Produce was selected based on similar size and firmness, and included 12 of each: carrots, cucumbers, peaches, and tomatoes. For example, one peach was placed in a bag and 1/4 cup of pine pellets was added. The bag was then sealed and placed in the refrigerator for observations. Each absorbent material had three trials for each type of produce plus a control group. Sixteen observations were made noting changes in appearance and firmness. Results Carrots, cucumbers, and peaches that were placed in bags with Zeolite rocks were preserved better than the other absorbent materials and the control group. Tomatoes placed in bags with Zeolite rocks showed the same amount of preservation as the control group; both of which were preserved better than the other absorbent products. Conclusions/Discussion Zeolite rocks have a three-dimensional honeycombed structure and possess a negative charge. This allows the rocks to attract the ethylene gas that fresh produce naturally contains in order to ripen and eventually rot. The rocks remove some of the ethylene gas by trapping it in the honeycomb structure, allowing the produce to stay preserved longer. My conclusion suggests that Zeolite rocks should be used when storing produce to help it remain fresh.	
Summary Statement My experiment proves that absorbent products can be used to preserve produce longer.	
Help Received Teacher helped edit report; Mother helped prepare display board.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Upinderpreet K. Gill	Project Number J1807
Project Title Survivor: Episode of Oral Bacteria	
Abstract Objectives/Goals The objectives and goals for my Science Fair Project are to obtain the data that allows me to figure out which antibiotic agent works the best and the strongest. Today, having oral bacteria and other diseases, such as tooth decay, is a problem for many people. I would like to help those people by obtaining my results and going around different classrooms in my school to help those children learn the difference between these items. Methods/Materials For my project I needed certain materials some of which include Nutrient Agar, Act Mouthwash, and different tree branches which are used in other countries and America for oral purposes. For my experiment, I created agar on petri dishes as a surface for the bacteria to grow. Next, I took oral bacteria from my mouth and placed it on the agar. Then, I kept the petri dishes in a warm place, so the bacteria could grow. After two days, I took observations and added antibacterial agents to the bacteria by using filter paper and the sticks. After two minutes I cleared the antibacterial agent and kept the petri dishes in the same place and temperature as before. Then, after another two days, I took out the bacteria and made observations, again, so I could compare my results with and without the antibacterial agents. I repeated my project three times for a total of three trials. Results Project Not Yet Completed From County Abstract In my results, I found that all of the antibacterial agents did get rid of the bacteria. The only one that still had the bacteria left was the control, no bacterial agent, but not much more bacteria had grown after that either. Conclusions/Discussion Project Not Yet Completed From County Abstract In conclusion, my hypothesis was partially correct because the Act Mouthwash did get rid of the bacteria, but it was not the only one that did that. I hope to share this information with many people because having tooth decay is just as important as anything else and nowadays people do pay much attention to things such as this.	
Summary Statement My project is about the effect of natural antibacterial agents on oral bacteria.	
Help Received Mrs. Oliver helped write procedure and gather materials; Mother helped gather materials, supervise, and construct display board	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Robert E. Gray	Project Number J1808
Project Title Examining the Cleaning Effects of Practical Household Solutions on Produce	
Objectives/Goals The purpose of my project was to investigate ways to clean produce with the intention of reducing/eliminating bacteria. I tested bacteria counts on spinach and green onions. I used 4 methods of treatment. My hypothesis was that exposure to ultraviolet light for 120 seconds would have the greatest reduction in bacteria. My goal was to find a method of cleaning vegetables that would decrease bacterial contamination on food.	
Abstract Methods/Materials Method for spinach trials;1-Separate unwashed spinach into 5 piles with 15 leaves in each; 2;-Fill 15 test tubes with 10ml of distilled water; 3-Swab 2cm of the stem and 2 cm of the spinach leaf; 4-Cut swab into a test tube; 5-Swirl for 30 seconds; 6-With pipette, draw 1/10th ml of the solution; 7-Drop the 1/10th ml onto agar plate; 8-Dip a bent glass rod into methanol alcohol; 9-Sterilize glass rod; 10- rotate glass rod around the agar plate to even out solution; 11-incubate 48 hours 37°C; 12- Remove and tape closed; 13-Count bacteria colonies, record results; 14- repeat 3-13 14 times for a total of 15 trials. Tap water: Repeat steps 1-2; Wash 15 spinach leaves in 2 liters of tap water for 60 seconds; Repeat 3-14. Hydrogen Peroxide: Repeat steps 1-2; Wash 15 spinach leaves in 2 liters of a 0.3% solution of hydrogen peroxide for 60 seconds; Repeat 3-14. Repeat steps 1-2; Place 15 spinach leaves 10cm under a germicidal UV light for 60 seconds; Repeat 3-14. Repeat steps 1-2; Place 15 spinach leaves 10cm under a germicidal UV light for 120 seconds; Repeat 3-14. Green onion trials: Repeat the entire process using green onions in place of spinach.	
Results Spinach; On average the least amount of bacteria was on spinach treated under UV light for 120 seconds with 28 bacteria colonies. Control had 279 colonies. Green onions; On average the least amount of bacteria was on green onions treated under UV light for 60 seconds with 15 bacteria colonies. Control had 116 colonies on average.	
Conclusions/Discussion I correctly predicted that spinach exposed to UV light for 120 seconds would have the least amount of bacteria colonies. Control was not the highest as I had expected. Exposure to UV light for 60 seconds had 5% more colonies than the control. Green onions: 60 second exposure to UV light had the least amount of bacteria (vs. the 120 second exposure I predicted). The control on green onions had the highest bacteria counts as I predicted.	
Summary Statement Testing different methods of cleaning vegetables to see what best reduces or eliminates bacteria.	
Help Received My mom helped with the typing and she took pictures. Mr. Whittington, a high school biology teacher, helped me figure out the best methods for taking bacterial samples. He also provided lab equipment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jennifer K. Hakala	Project Number J1809
Project Title Does Anti-bacterial Soap Kill More Bacteria than Non-bacterial Soap?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this investigation was to see which soap left the least amount of bacteria using specific brands listed under materials below. My hypothesis was the Softsoap Non Bacterial soap would kill more bacteria.</p> <p>Methods/Materials People washed their hands with the following soap brands: Dial Non Bacterial, Dial Anti Bacterial, Softsoap Non Bacterial, and Softsoap Anti Baterial Soap. Additionally, bacteria on an unwashed hand was measured. The bacteria left on their hands was transported to a Petri Dish containing a formula which fed bacteria. Growth of bacterial was measured daily over a four day period, with the amount of bacteria recorded daily. A percentage was calculated based upon the area of bacteria divided by total area of the Petri Dish. A higher percentage indicated a greater amount of bacteria.</p> <p>Results The results of the data collected through observations showed that the brand Softsoap Non Bacterial soap left the least amount of bacteria, while Dial Anti Bacterial soap left the greatest amount of bacteria.</p> <p>Conclusions/Discussion The results supported my hypothesis and lets me know which soap leaves hands the cleanest with the least amount of bacteria remaining.</p>	
Summary Statement Is anti bacterial soap more effective in killing bacteria than non bacterial soap?	
Help Received 5 school friends washed their hands with the materials, My science teacher assisted with Petri Dishes.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Charlie J. Hughes	Project Number J1810
Project Title Discovering a Way to Repel Mosquitoes by Using a Mixture of Paint and Mosquito Repellent	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project is to discover if different amounts of coats of a mixture of mosquito repellent and paint repel different amounts of mosquitoes. I would like to use my results to repel mosquitoes from the standing water in horses# water troughs.</p> <p>Methods/Materials To test my experiment, I constructed the Mosquito Containment Apparatus. This was a larger rectangular prism with a smaller rectangular prism attached on one side. I also constructed 16 dowel rods. I changed my variables for these rods by using different amounts of coats of a mixture of mosquito repellent and paint. I then inserted one group of rods (4 of the same variable) into the smaller rectangular prism. With the 250 mosquitoes in the larger prism, I then counted the mosquitoes that flew into the smaller prism and labeled them as non-repelled.</p> <p>Results The results of my experiment show that using three layers of this mixture is most effective, and one and five layers were both effective, but not as accurate as the three layers. The three layer rods had an average of 11 mosquitoes non-repelled, and both one layer and five layers had an average of about 13 mosquitoes. All of my rods with the mosquito repellent in them repelled more than my control, which was regular paint and had an average of about 17 mosquitoes.</p> <p>Conclusions/Discussion Finishing my experiment, I concluded that when painting a mixture of mosquito repellent and paint to repel mosquitoes it is most effective in three coats.</p>	
Summary Statement Finishing my experiment, I concluded that when painting a mixture of mosquito repellent and paint to repel mosquitoes it is most effective in three coats.	
Help Received Rory McAbee provided 250 live audlt mosquitoes	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Joshua P. Kisbye	Project Number J1811
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Project Title
Analyzing and Comparing the Effects of Soda on Teeth

Abstract

Objectives/Goals
The objective is to determine which brand of soda causes the egg to lose the most amount of mass.

Methods/Materials
Twenty-one [21] Wal-Mart clear plastic cups; Twenty-one [21] Sunnyside chicken eggs; Five [5] cans of 12ozPepsi [regular]; Five [5] cans of Coca-cola12oz [regular]; Five [5] Cans of Dad#s old fashioned Root Beer12oz [regular]; Five [5] Cans of Dr. Pepper12oz [regular]; One [1] Ohau's Triple Beam Balance Scale; One [1] Cans of Tap Water; One [1] (43cm) forty centimeters x twenty two centimeters (22cm) Metal Pan.
1.The first step is to purchase 5 cans of Dr. Pepper, 5 cans of Pepsi, 5 cans of Coca-Cola, 5 cans of Dad#s Old-fashioned Root Beer, 21 clear Wal-Mart plastic cups, and 1 can of tap water from the sink; 2.The next step is to layout all the materials; 3.The next step is to put all the Sunnyside eggs into the cups; 4.Weigh the cups; 5. The next step is to poor the Coca-Cola into cups 1-5; 6. Repeat step 4 instead of Coca-Cola poor Pepsi into cups 6-10; 7.Repeat step 5 except poor Dr. Pepper into cups 11-15; 8.Repeat step 5 except with Root Beer into cups 16-20; 9. Repeat step 5 except with water into cup 21; 10.Weigh all cups; 11.Put the cups into the 43cm x 22cm metal Pan; 12.Leave the sodas and tap water with the eggs for 2weeks.
Every 2 days measure the calcium in the egg by putting the cup with soda or water on the triple beam balance scale. On the last day take the final measurements and dispose of the materials such as the eggs, sodas, etc

Results
Pepsi was the 2nd to best on average.(128.52)
Coca-Cola was the 3rd to best on average.(127.82)
Root Beer was the best on average.(138.06)
Dr. Pepper was the worst on average.(125.28)

Conclusions/Discussion
After completeing my investigation, I found out my Hypothesis was partailly correct.(Root Beer was the best, Part wrong:Dr. Pepper was the worst instead of Coca- Cola.) I think kids and adults should watch what thy drink.

Summary Statement
My project is about comparing which soda causes the egg to lose the most amount of mass out of Dr. Pepper, Pepsi, Coca-Cola, and Root Beer.

Help Received
My teacher helped with board revition and graphs. Parent helped cut out all papers.



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Adam C. Lopez	Project Number J1812
Project Title The Naked Tooth	
Abstract Objectives/Goals The objective of my project is to show that drinks with more additives will cause the most tooth decay. Methods/Materials I used "Monster" energy drink, Diet Coke, Sprite, Sprite Zero, and Clear American carbonated water in my project. During a 4-day period, a tooth was submerged in their respective drinks. Once a day, the teeth were carefully removed using tweezers, weighed, and documented the weight loss. Results The scale showed the tooth which was submerged in the Monster drink had the highest weight loss of 4mg, followed by Diet Coke with a weight loss of 2mg, and Sprite with a weight loss of 1mg. Sprite Zero and Clear American drinks remained unchanged. Conclusions/Discussion My conclusion is that drinks with high amounts of additives cause the most damage to the tooth enamel, in the form of discoloration and tooth decay. Monster energy drink dissolved the tooth enamel the most, at a total of 4mg.	
Summary Statement The ingredients and additives in energy drinks and sodas cause tooth decay.	
Help Received My Mother helped me take pictures and drive me to and from Via Verde Pharmacy to weigh the teeth with the assistance of Rich Reggio, Pharm. D.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Emily E. Luna	Project Number J1813
Project Title Investigating Enviromental Condition with Fingerprint Quality on Glass Surfaces	
Objectives/Goals Is to determine if you can find a good quality fingerprint when you put glass in the oven, freezer, and rain. I sent the 40 samples to local officers to judgethe fingerprints from a scale of 1-3. 1 being bad to use as evidence.3 being can be used as evidence.	
Abstract	
Methods/Materials -40 glasses -non-serol gloves -negative 10 degrees freezer -200 degrees oven Latent print feild kit -dusting brush -black fingerprint powder -fingerprint index card -ink pad -cutting blade -tape	
Results Rain on Glass -overall average of 2.2 out of 3 Heat on Glass -overall average of 1.1 out of 3 Freeze on Glass -overall average1.2 out of 3	
Conclusions/Discussion The overall result is that Rain has the best quality and should be used as evidence in a crime scene. Heat had the lowest ratingout of all.	
Summary Statement Investigating Enviromental Conditions with Fingerprint Quality on Glass Surfaces	
Help Received 3 police officers judge fingerprints	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Emelia E. Maglieri	Project Number J1814
Project Title Which Material Is Better at Blocking Bacteria in a Sneeze?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Abstract The purpose of my science project is to determine which material blocks the most amount of germs when sneezing. Everyone is concerned about health and no one wants to get ill. People are buying the product Airborne and taking vitamin C to keep them from getting sick. What if using a simple handkerchief could stop others from getting infected. Simply washing your hands is not enough when it comes to sneezing. I am using seven different types of materials in my investigation. The materials are a paper towel, napkin, tissue, a cloth handkerchief, and a bandana handkerchief. I will inoculate a nutrient broth with Bacillus Subtilis. After 48 hours incubation I will pour the broth into a spray container. I plan to spray the germs in a spray bottle at a two inch distance through the seven different materials onto a Petri dish. I will repeat this 10 times per material. The Petri dish will have agar and the germs will grow for 48 hours. I will count the germs using a centimeter graph transparency and figure out which material is most effective in blocking the spread of germs. In the control group I will not use any material to block the spray of the germs. I will simply spray the germs from the same distance onto a Petri dish.</p> <p>Conclusions/Discussion After completing my investigation on the spread of germs from a sneeze in different types of fabrics, I found that my hypothesis was correct. The handkerchief blocked the most germs. When compared to the other fabrics the handkerchief had the least amount of germs in the Petri dish. The other fabrics that I tested were a handkerchief, a tissue, a paper towel, and a napkin. The tissue was the least effective in stopping the spread of germs. The handkerchief and the paper towel were fairly effective in stopping the spread of germs. My investigation showed that germs do spread when you sneeze. Bacteria in a sneeze causes colds and viruses. The Petri dish with the germs from the bandana hardly had any bacteria in it while the Petri dish with the germs from a tissue was 25% covered in germs. In conclusion people should use a bandana when sneezing to stop the spreading of germs. There is an estimated 1,000,000 people a year that get viruses. By sneezing in a bandana viruses could be cut down.</p>	
Summary Statement I tested to see which material was the best in blocking bacteria in a sneeze from spreading.	
Help Received Carl Gong answered any questions that I had regarding my experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Andrea Mora	Project Number J1815
Project Title "Jell-O" or "Jell-NO"?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My object in this project is to find at what exact temperature will a pineapple denaturize by exposing it to heat so that it will not affect the setting of Jell-O.</p> <p>Methods/Materials By heating the pineapple, I will take the protein digesting enzyme out of it. I will then place all my Jell-O filled cups with the pineapple in them into the refrigerator for exactly 2 hours.</p> <p>Results The average pineapple that completely denaturalized itself at the lowest temperature of the water was the one put in at 75 degrees celcius.</p> <p>Conclusions/Discussion My conclusion is that the least temperature in which you can make Jell-O dessert with pineapple is 75 degrees. Fresh pineapple in the Jell-O will not make it set because of the protein digesting enzyme that the pineapple has.</p>	
Summary Statement Denaturizing pineapple- finding the temperature of water that when pineapple put in not affect setting of Jell-O.	
Help Received Mother supervised stove use.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kajal J. Patel	Project Number J1816
Project Title Healthy or Hazardous Hair Help?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Can added cysteine amino acid in hair conditioner strengthen or make hair more flexible? Hypothesis: Since keratin, the strong part of hair, contains cysteine (an amino acid), added cysteine amino acids should make the strand stronger, but less flexible. I will define strength of the hair as how much weight it can support.</p> <p>Methods/Materials For each group (2 trials) in the experiment, I used duct tape, two raised platforms, 100 pennies, a small gift bag, a foot ruler, cysteine amino acid capsule, 20 ml hair conditioner, 20 ml water, two small sticks, scissors, 4 legos, 2 milliliter measuring cups, a napkin, and a marker.</p> <p>Both measuring cups (labeled #Cysteine# and #Regular# by the marker) were filled with 10 ml water, and 10 ml conditioner. One cysteine capsule was added to the cysteine cup, as the manipulated variable. One strands of hair would sit in each of the formulas for 5-10 minutes. On one platform, two legos were taped down at the edge about 1.5 inches apart. The small bag was taped to the ruler on its edge. After both strands of hair had been dried, one of them was taped between the two legos. Then, the bag was placed through the strand so that the ruler was in between the two legos. The other end of the hair was taped to the other platform. Once the bag had been moved to the center of the hair and taped there, I added pennies one by one. At every three pennies, the length of the hair shown on the ruler at the end of the platform in between the legos, was recorded. Once the hair broke, the number of pennies was counted and recorded. The experiment was then repeated for the other hair. I conducted 50 trials in total (25 trials with cysteine treated hair, 25 without).</p> <p>Results The average number of pennies held by the regular hair was 34.44, and the average number of pennies held by the cysteine hair was 32.52. As for the elasticity, the regular strand stretched, on average, 24% of its original length, while the cysteine hair stretched 19% of its original length. For both the cysteine and regular strands of hair, the same pattern of elasticity occurred.</p> <p>Conclusions/Discussion Added cysteine amino acid in hair conditioner does not strengthen it, nor does it make it more flexible. The regular hair was 6% stronger and about 20% more flexible than the cysteine strand. Cysteine should not be an ingredient in shampoos or conditioners, because it appears to damage and weaken hair.</p>	
Summary Statement "Healthy or Hazardous Hair Help?" is a study of the effects of cysteine amino acid on hair strength and elasticity.	
Help Received Sister recorded information (numbers) while I conducted experiment and called them out	



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Max J. Pierro	Project Number J1817
Project Title Is Ice All You're Getting?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project was to see if the ice in fast food restaurants meets water quality standards. My hypothesis was that some of the restaurants I tested would show bacterial contamination in their ice, and that restaurants with ice machines open to the public would have more bacteria than the ones that weren't available to the public.</p> <p>Methods/Materials I used 41, 240 ml containers, with lids, 41 Petri dishes, 41 pipettes, and 41 Culture Plates. For my procedures I went to eight restaurants and collected five ice samples from each restaurant. Then I placed the ice in sterile containers and put them in my cooler. For my tests I used a culture medium called Coliscan Easygel. I used sterile pipettes and extracted sterile water from a 240 ml container as a sterile control. 3ml of each melted ice sample was transferred into the Coliscan and poured into Petri dishes, I sealed the plates and put the samples into an incubator at 36 degrees Celsius. Then I waited 48 hours for my results.</p> <p>Results Panda Express, Wendy's, and Taco Bell ice samples all showed no bacterial contamination and grew no colonies. Kentucky Fried Chicken and Chipotle ice samples grew only a few colonies in the culture plates. McDonald's ice samples had the second greatest amount of bacteria of all the restaurants. In one of the McDonald's samples, the plate contained 486 total Coliform and non-Coliform colonies which represented an estimated 14,985 colonies per 100ml of water. Jack in the Box had the greatest amount of bacteria of all the restaurants tested. In one of the Jack in the Box plates there was an estimated 768 colonies, mostly Coliforms, corresponding to 21,545 colonies per 100 ml of water!</p> <p>Conclusions/Discussion It is clear that in some restaurants their methods of handling ice need to change. If I were to pursue this project further, I would test multiple restaurants such as several Jack in the Box or McDonald's restaurants. I would also try testing the restaurants one day each week for several weeks to develop an average for a more reliable result.</p>	
Summary Statement The goal of this project was to culture ice samples from fast food restaurants to determine if the ice would meet drinking water quality standards.	
Help Received I would like to thank my mother for driving me to the various fast food restaurants, and I would like to thank my science teacher for her time and proof-reading.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Sarah L. Pilegard	Project Number J1818
Project Title Which One Has More Vitamin C, Freshly Picked and Squeezed or Store Bought Orange Juice?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project is determining which orange juice has the most vitamin C, freshly picked and squeezed or store bought juice. My hypothesis is that the freshly picked and squeezed orange juice will have more vitamin C.</p> <p>Methods/Materials I used an iodine indicator solution which gave me a color variation when I added the orange juice. I then developed a color scale to judge each test. The solution consisted of cornstarch, water and iodine. I put that in test tube and then added the orange juice. If the resulting color stayed dark, that indicated there was less vitamin C in that juice, but if the resulting color was lighter than the indicator solution, then there was more vitamin C in that juice. The juice was sampled from 18 separate oranges from the same tree and 18 separate bottles of orange juice from the same brand of juice.</p> <p>Results The fresh orange juice averaged lighter on the color scale indicating more vitamin C. The store bought juice averaged darker on the color scale indicating less vitamin C. I recorded these results using numbers and colors representing the shades shown in the test tubes.</p> <p>Conclusions/Discussion The freshly picked and squeezed orange juice had more vitamin C proving my hypothesis to be correct. In my research I gained knowledge of how an indicator solution works by going through a chemical reaction and just how important vitamin C is for your body. From my experiment I learned which juice to drink to get the most vitamin C.</p>	
Summary Statement Using an iodine indicator, I developed a color scale to determine whether or not freshly picked and squeezed orange juice or store bought orange juice had more vitamin C.	
Help Received Mother helped figure out the graphing program, used the paper cutter and took some of the pictures.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Benjamin E. Porter	Project Number J1819
Project Title PLAX vs. Listerine: Which Kills the Most Bacteria?	
Objectives/Goals Abstract The purpose of my project was to determine what two types of mouthwash would kill the most bacteria. This experiment involved testing three people to determine which had the most plaque after rinsing with each of the two mouthwashes. To do this I took samples by swabbing Silvia from the tongue of these people before and after. Then I swabbed the samples in a 3x3 pattern onto a blood agar Petri dish. Each test was conducted twice with each of the mouthwashes and once with out, totaling six tests for each person. The results of my experiments showed that Plax mouthwash reduced bacteria growth best. My original hypothesis was that Listerine would reduce bacteria growth best. The information gained from this project could be used by mothers concerned about the care of their children.	
Abstract	
Methods/Materials Procedures: 1. I got the cotton swabs ; 2. I got the three people. 3. I got them to swab their tongue. 4. Then swab the agar 3x3 formation. 5. Then I got the mouthwash. 6. After that, I pour one fl oz in each one cup. 7. Then, they swigged it for 30 second. 8. Next, I got them to swabbed tongue. 9. The swab it on the agar. 10. After that, I wait one hour to get them to swab their mouth again. 11. I repeated it again for Listerine Materials List: Blood agar plates, Cotton swabs, Plax mouthwash, Listerine mouthwash, Dixie cups.	
Results Experimental Results The purpose of my project was to determine what two different types of mouthwash Plax or Listerine kills the most bacteria in the mouth. The results of my experiment did not support my that hypothesis Listerine would kill the most bacteria	
Conclusions/Discussion Conclusion As I stated in my hypothesis, I believed the Listerine would kill that most bacteria. The experimental data didn't support my hypothesis, indicating that Plax killed the most bacteria. The reason I got my results is that Plax is more acidic than Listerine.	
Summary Statement The purpose of my project was to determine what two types of mouthwash would kill the most bacteria.	
Help Received First, Mr. Scott for all the hours he has spent helping me put this project together. My mom for helping with me tests, and my brother for helping me with my tests.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Ranjana Ravikumar	Project Number J1820
Project Title Yummy Yogurt	
Abstract Objectives/Goals The objective was to identify how the temperature of the milk influences the time it takes for the milk to turn into yogurt. My goal was to solve my mother's problem in identifying the optimal temperature and time to convert milk into fresh, firm, and tangy yogurt. Methods/Materials Materials: 1 thermometer, 12 x 2/3 of a cup of 1% milk, 12 tablespoons cultured yogurt, 4 heat resistance cups, an oven, 12 labels, Measuring Cup Procedure: 1. Pre-heat the oven to 80F. 2. Using the measuring cup, pour 1% milk into the cup until it is filled 2/3rd. Then transfer the contents of the measuring cup into a microwavable safe bowl. 3. Then microwave the milk till it boils. 4. Repeat step 2 and step 3 for 3 more bowls. 5. Cool the boiled milk in the first cup to 120F, transfer one tablespoon of cultured yogurt into the milk and put the cup into the oven. 6. Repeat steps 5 for the remaining three cups, each time cooling the milk by ten degrees less than the previous cup at the time of adding the cultured yogurt. 7. Place the cups one by one into the oven with the oven light on, thereby maintaining an ambient temperature of 80F. 8. Based on my pre-test experiment I would check the status of the milk in the cups after, say about 6 hours. Then every 15 minutes after that. 9. After a cup has been turned into yogurt I would record it on my data table. Results I conducted my experiment at four different temperature points (120F, 110F, 100F and 90F) and carried out 3 trials at each point. With 120F as the setting temperature, it took an average of 5:04:20 hours for the milk to turn into yogurt. At 110F it took 4:43:00 hours, at 100F it took 4:11:00 hours, and at 90F it took 4:48:20 hours to turn into yogurt. Conclusions/Discussion My research guided me to conduct the experiments with the temperature of the milk in the range of 70F - 118F. The ambient temperature was maintained at 80F during the process of curdling the milk into yogurt. My conclusion is that the optimal temperature for the milk to turn into yogurt is at 100F. My experiment yielded no inconsistent data in relation to my hypothesis. I was thus able to identify the optimal temperature of 100F to create fresh, tangy yogurt with a firm	
Summary Statement To identify the optimal temperature and time to convert milk into fresh, firm, and tangy yogurt.	
Help Received My Mother gave me the idea to do this project and for buying all of the supplies that I needed to conduct this experiment; Mrs. McCleary, Science Specialist at the Alderwood Basics Plus School, for teaching us to conduct the Science Fair Project and write the project report; My Father helped me to revise and edit	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Randi N. Robertson	Project Number J1821
Project Title The Effects of Highlighting Solution on Hair	
Abstract Objectives/Goals By conducting this experiment I am trying to find the average strengths of five different colors of hair after being treated with the highlighting solution. These hairs include blonde, light brown, dark brown, black, and auburn hairs. All of which are natural non-treated hairs or virgin hairs. I chose this experiment for the reason being that I wanted to find out how much the highlighting process damage#s your hair. It is weakened since some of the molecules are removed and the keratins started to brake down which leads to the decrease in strength of the strands of hair. Methods/Materials To carry out my experiment I had to measure the hairs to find their original strength, then I treated them with the solution. Next, I had to measure the strands to find the results after being treated with the solution. The materials that I used included a 2.5 newton spring scale, 50-100 strands each of blonde, light brown, dark brown, auburn, and black hair. Also I used a perm bowl and brush, tape, foil, a sink, a towel, water, a timer, a camera, gloves, scissors, safety goggles, soap, one bottle of pure white 40 volume crème developer, and basic white powder bleach. Results After treating the strands of hair I calculated the average strengths of the treated hairs. The results are as follows: the blonde hair averaged 1.2 newtons, the light brown hair averaged 1.6 newtons, the dark brown hair averaged 1.3 newtons, the black hair averaged 1.8 newtons, and the auburn hair averaged 1.4 newtons. Conclusions/Discussion After conducting and completing my experiment I found that my hypothesis was correct. The blonde hair was the weakest and it averaged 1.2 newtons. The black hair was the strongest and it averaged 1.8 newtons. As the results confirm the blonde hair was the weakest and the black hair was the strongest out of all five colors of hair.	
Summary Statement Finding the affects of the highlighting solution on various colors of hair.	
Help Received Transportation provided by parents to acumulate supplies and equipment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Rima T. Sabih	Project Number J1822
Project Title Bacteria Police	
Abstract Objectives/Goals My objective was to determine which type of the following liquid antibacterial soap would kill the most bacteria: Dial, SoftSoap, or Target soap. My hypothesis was that Dial would kill the most bacteria. Methods/Materials I used 10 petri dishes that were split into three parts, where I poured agar solution into each part of the petri dishes. I allowed the agar to dry before I planted <i>Micrococcus luteus</i> , which is a common skin bacteria. Afterward, I placed the petri dishes into a homemade incubator. Results SoftSoap killed the most bacteria. It killed 59% of the bacteria, while Dial and Target soap killed 53% of the bacteria. Conclusions/Discussion My conclusion was that my hypothesis was incorrect and SoftSoap killed the most bacteria. However, all the antibacterial soaps that I used killed only a certain amount of the skin bacteria but they did not eliminate all of the bacteria.	
Summary Statement My project is to determine which type of liquid antibacterial soap would kill the most bacteria.	
Help Received My father helped cut the Plexiglas hole for my homemade incubator, which I could not do for safety reason.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Daniel S. Sakakini	Project Number J1823
Project Title Does Lutein Content Vary Significantly in Domestic vs. Imported Avocados?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to see if there really was a significant difference in the nutritional benefits of avocados picked and shipped from Chile and locally grown avocados from my backyard. I thought that there might be significant differences in some nutrients, but I couldn't decide which nutrient to test. After researching my idea, I chose to test lutein, an important nutrient in avocados.</p> <p>Methods/Materials I used many materials in my project. I first surveyed for taste preferences comparing Chilean and local (my backyard) avocados. To test for the lutein content I needed to do Thin Layer Chromatography. It was difficult to obtain a laboratory where I could carry this out. I was finally able to do my testing at UCSD.</p> <p>Results My hypothesis was not supported by my results. After completing my thin layer chromatography, I found that there were almost no differences in lutein content between each avocado tested, although, according to my taste preference survey, the avocados from my backyard appeared to taste better.</p> <p>Conclusions/Discussion My conclusion is that one reason there may be no difference in lutein content was because all avocados have a protective skin on the outside, which helps to preserve the nutrients. Also, even local avocados are picked long before they ripen, so they will not bruise or spoil before they are purchased. This may mean that both types of avocados are picked at roughly the same point in the ripening process.</p>	
Summary Statement My project compares flavor and lutein contents of Chilean avocados versus locally grown avocados through taste preference tests and the assessment of lutein content using thin layer chromatography	
Help Received Dr. John Kosmatka helped find Professor Pomeroy; Professor pomeroy who provided me with a laboratory and supervision; Mr. Syed Rehan who helped me learn about thin layer chromatography	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Katelyn E. Shipp	Project Number J1824
Project Title Green Clean: A Comparison of Cleaner Effectiveness and Electrical Conductivity	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to determine if there is an industrial cleaning chemical as effective as sodium hypochlorite (bleach), but with a lower electrical conductivity (EC) than bleach. It was hypothesized that the potassium based cleaners would have a lower EC but would clean as well as the sodium based cleaner.</p> <p>Methods/Materials The three cleaning chemicals tested were sodium hypochlorite (NaClO₂ - bleach), potassium hydroxide without bleach (KOH), and potassium hydroxide with bleach (KOH NaClO₂). The chemicals were diluted to their normal usage concentration and their electrical conductivity was measured and recorded. The cleaners were then tested on three common surfaces found in a food processing plant: stainless steel, plastic conveyor belt, and rubber conveyor belt. The surfaces were coated with carrot pulp for 18 hours and then rinsed with water. A control swab was taken on each area of each surface. A portion of each surface was then sprayed with four squirts of cleaning chemical. After waiting 5 minutes, the cleaners were rinsed off and swab samples were collected from each area. These samples were tested with an ATP bioluminometer. The data from the ATP meter was collected and recorded to determine which cleaner cleaned the best.</p> <p>Results The results for the electrical conductivity test were: Bleach - 148,000 ms, KOH with bleach - 18,200 ms, and KOH without bleach - 9,760 ms. The KOH with bleach was the best cleaner on all 3 surfaces and KOH without bleach was second best on two of the three surfaces. Thus, the results supported the hypothesis. The potassium cleaners worked better than the sodium cleaner (bleach) and had a significantly lower EC than the bleach.</p> <p>Conclusions/Discussion The groundwater in the San Joaquin Valley has a high salinity level. This is a problem because it can kill crops. Sodium hypochlorite is the most common food processing plant cleaner. This project attempted to find a cleaner with a lower electrical conductivity than bleach that is still as effective as bleach. The results supported the hypothesis that there are cleaners that can clean as well as bleach, but with a lower EC than bleach. Because of the large differences between the ECs of the cleaners, the potassium based cleaners are better choices environmentally.</p>	
Summary Statement This project tested 3 industrial cleaning chemicals to determine if cleaners with lower electrical conductivity (potassium based) would clean as well as higher EC cleaners (sodium based).	
Help Received Qualified Scientists Joe Purcell, Jamie Salcedo, Tracy Parnell, Rosemary Lopez and Glen Betz for supervision and help with the chemicals and testing. Mr. Walker for the safety equipment, and my mom and dad who provided me with transportation and guidance.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kaylee S. Steiner-Olson	Project Number J1825
Project Title Natural Ant Repellent	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to test which natural spices: wasabi, cayenne pepper, black pepper, tumeric or cinnamon would act as a deterrent to ants. I hypothesized that cinnamon would be the best natural repellent.</p> <p>Methods/Materials The first step in my experiemnt was to determine what the ants were attracted to because some ants go for sweet items, some for meat items and some like both. I placed the same amounts of wild flower honey and organic beef drippings on paper plate circles with a 5 1/2 inch diameter and offered them to the ants. They went for the honey. After determining the food item to use, I measured and taped 8, 9X9 squares on the floor near an ants source. In each 9X9 square, I placed a paper plate circle measuring 5 1/2 inches in diameter. In the middle of each circle, I placed 1 tsp. of honey. On five of the circles I placed a ring of each spice (tumeric, wasabi, black pepper, cayenne peper and cinnamon) measuring 2 tsp. around the honey but 1/2 inch away from it. In the left over sqaures I placed a circle with just honey on it, a circle with nothing on it and an empty sqaure with nothing in it.</p> <p>Results The tumeric and cinnamon had the fewest number of ants in the square and on the circle. The cinnamon had the least amount of ants over all and no ants made it through the cinnamon barrier.</p> <p>Conclusions/Discussion My conclusion is that cinnamon would work the best as a natural ant repellent. I watched the few ants that did approach the cinnamon ring; it was as if there was a force field that was preventing them from entering. Surprisingly, the wasabi had the most ants and was not much of a deterrent.</p>	
Summary Statement My project is about finding a natural repellent that would safely deter ants from human environments.	
Help Received I got help from teachers at Monument Middle: my mom, Ms. Steiner and Mr. Quintal who willingly let me use their classrooms to test the ants. My dad suggested the grid test for the ants.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kiran Suryadevara	Project Number J1826
Project Title Effects of pH on the Browning of Cut Apples	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I conducted my experiment to determine which acidic fruit juice or tap water would help to best prevent enzymatic browning from occurring on the surfaces of freshly cut apple slices.</p> <p>Methods/Materials Apple slices were dipped, one per each of seven juices: apple, pineapple, orange, lemon, lime, white grape, and white grapefruit, along with tap water for five minutes. They were then removed from their respective juices and observed during four intervals occurring at 15 minutes, 3 hours, 6 hours, and 9 hours, to see what antibrowning effects the acidic juice and water had on the cut surfaces of apple slices. I developed and used a browning scale to determine my results.</p> <p>Results The apple slices soaked in lime (pH 2.38) and lemon (pH 2.49) juices consistently performed the best, in terms of inhibiting the browning of cut apples at all select intervals, while the slices soaked in less acidic juices were not as good in preventing browning. This was true, but for one exception. Orange juice (pH 3.87) dipped slices performed better than white grape (pH 3.49) and apple juice (pH 3.79) dipped slices, in spite of having a lower pH than orange juice.</p> <p>Conclusions/Discussion I have proven my hypothesis such that the acidity of a fruit juice plays an important role in inhibiting enzymatic browning of cut apples, thus apple slices dipped in low pH juices like lemon and lime, will maintain their fresh-cut apple color longer. In the case of the apple slices dipped in orange juice, I can also conclude that they maintain the fresh-cut apple color better than apple and white grape dipped slices due to the fact that orange juice is known to contain high levels of the antioxidant, ascorbic acid (also known as vitamin C), than the other two. Both ascorbic and citric acids are important factors to make note of in juices, since they are antibrowning agents.</p>	
Summary Statement Acidic juices of various pH were tested along with tap water to observe their effectiveness in preventing the oxidation of freshly sliced apples.	
Help Received My science teacher, Ms. Skiles, guided me throughout the project. My Mother helped me to make the needed, fresh fruit juices for my experiment, and my Father helped me in creating a browning scale and graphs.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Alana Torres	Project Number J1827
Project Title Garlic, Spider Plant, and Noni Fruit: Possible Antibiotic Substitutes	
Abstract Objectives/Goals Objectives/Goals: My project tested three plant products: noni juice, spider plant root, and garlic for their ability to inhibit bacterial growth. Noni juice is currently a \$2 billion dollar industry, but many of its medicinal claims haven't been scientifically tested. Methods/Materials Methods/Materials: My experiment involved two trials and a total of 57 plates. In Trial one, I prepared agar plates by mixing extract from noni juice, garlic, spider plant root with LB (Luria Bertania) nutrient media. I made plates containing ampicillin(the positive control) and sterile water (the negative control). I then inoculated the plates with a harmless strain of E. coli(E. coli DH5 -T1R) .The plates were incubated at 37 degrees C for 16 hours. The plates were then examined, and I performed a colony count. Results Results: The average colony counts were as follows: sterile water control - 400; garlic - 344; spider plant - 504; noni - 0; ampicillin - 0. A second trial was performed using plates made with LB nutrient agar and noni juice mixed to the following concentrations: 12%, 6%, 3%, 1.5%. The growth of E coli on these plates was compared to the positive control(ampicillin) and the negative (sterile water). The colony counts were as follows: sterile water control - 444; noni 12% - 0; noni 6% - 504; noni 3% - 492; noni 1.5% - 696; ampicillin - 0). Conclusions/Discussion Conclusions/Discussion: According to the results, the garlic extract and spider plant extract at the test concentrations were unable to significantly inhibit the growth of E. coli. However, this study did demonstrate that noni juice at a concentration of at least 12% completely inhibits the growth of E. coli on nutrient agar plates. This study does not necessarily prove that noni juice can successfully treat bacterial infections in humans, but clinical trials using noni might prove interesting.	
Summary Statement This experiment examines the effectiveness of garlic extract, spider root extract, and noni fruit as antibacterial agents in comparison with ampicillin.	
Help Received Mother and Father helped with transportation; Used lab and equipment at Kalypsys Pharmaceuticals under the supervision of Dr. Eben Massari; Lab provided to me by Rich Heyman	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Haley F. Washburn	Project Number J1828
Project Title Do Different Juices Affect the Effectiveness of Antibiotics?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my science project is to determine if different juices will help my test antibiotics create a larger area of bacterial inhibition than they would have alone. It is commonly believed that green tea, pomegranate juice, grapefruit juice, and cranberry juice are beneficial to your health; for this reason I wanted to see what would happen if I mixed them with penicillin and amoxicillin.</p> <p>Methods/Materials For my control I tested the antibiotics and juices individually to determine if they created an area of inhibition around the test dot. To do this I dipped an absorbent test dot in the test liquid and placed it in a petri dish that I swabbed with the bacillus subtilus bacteria. After I completed my control tests I mixed 10 ml of a test antibiotic and 50 ml of a test juice in a seperate perscription container. I repeated the steps I used to test my control liquids to test my mixed liquids. Each test was repeated 11 times for more accurate results. After 48 hrs and 96 hrs I measured the areas of inhibition and documented them in my log book. I had a total of 17 different test substances.</p> <p>Results After 48 hrs of incubation all of my mixed test substances had larger areas of inhibition than the control substances. After 96 hrs the mixed test substances still had larger areas of inhibition than the control test substances, however the overall areas of inhibition were decreasing.</p> <p>Conclusions/Discussion Through testing I discovered that these juices did help the antibiotics to create a larger area of inhibition. However, through my research I discovered that while these juices have health benefits on their own, they also contribute to negative drug interactions. I feel that further investigation is needed before drinking these juices while taking medications.</p>	
Summary Statement The objective of this project was to determine if by adding juices with possible health benefits to antibiotics you then increase the antibiotics ability to fight bacteria.	
Help Received Dr. Mary F. Paine Ph.D., provided guidance and research information., Dr. John Inouye M.D. provided antibiotics., Mr. Carl Gong provided petri dishes and bacteria., My mom photographed my experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Crysta L. Williams	Project Number J1829
Project Title Shampoo's Effect on Tensile Strength	
Abstract Objectives/Goals The purpose of this experiment was to see if shampoos affect the strength of human hair. I have always wondered if shampoo has an affect on the hair. It has been stated that you should switch shampoos once a month because your hair gets used to the same shampoo, and when you're switching it is thought that hair will be more manageable. Methods/Materials The procedures ussed were: wet the hair, soak the strand in the shampoo for two minutes, then rinse thoroughly and let dry. Once the hair is dry, test the strength of the hair that was tested by using a spring scale. The force before breakage was recorded. Repeat nine times for each hair color for a total of ten trials. Results The procedurawas consisted of 15 cards with each card stating what color hair, what type of shampoo, and the ten recordings for each spring test. The average for each hair color per shampoo used was calculated and entered on the cards. The data also includes pictures of the spring scale and the shampoos used. Conclusions/Discussion The conclusion was inconclusive. The reason why was due to the different affect each hair color had with the various shampoos. It was found that brown hair with Pert Plus, red hair with Herbal Essence, and blonde hair with Kids Suave. The findings were that not one single shampoo works best for all hair types.	
Summary Statement Red, blonde and brown hair were all treated in five different brands of shampoo to determine if the strength of each hair color could be improved.	
Help Received Mother helped with recording the data as I was testing and taking pictures.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Alex Zivkovic	Project Number J1830
Project Title Got Water?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment was to test which brand of water would be purest in terms of chemical levels, as well as by the amount of common bacteria present. I also tested which group of water (bottled water versus tap water, filtered water versus natural water, etc.) is the healthiest overall.</p> <p>Methods/Materials In order to complete my project, I needed 37 agar petri dishes for the 9 brands of water I tested. For each brand of water, I required 4 bottles for my sample size. To complete the chemical analysis, I needed 12 iron, nitrite, nitrate, phosphate, pH, and water hardness test strips. To swab the water onto the petri dishes, I required 74 double sided q-tips. Other materials included labels cups and sandwich bags. I would place a milliliter of water into each Petri dish to grow common bacteria. I would also put water test strips to analyze the amount of chemicals in the water.</p> <p>Results The results of my experiment were recorded in multiple ways. One way that I judged the purity of the water was through the number of bacteria that each sample grew. A second way was by noting the speed that the bacteria developed and the trends they showed. The last variable that I used to decide which brand was the best in purity was the chemical analysis of each water. All of the results showed that every water was at a healthy level, while some were healthier than others.</p> <p>Conclusions/Discussion In conclusion, many of the results reflect my hypothesis. Filtered water, that was not bottled, had the greatest bacteria counts. Municipal water had lower chemical levels than other brands, however they lacked beneficial levels of these chemicals. After completing a side project where I placed the bottles in a car for a week, I noted that there was a dramatic increase in phosphate levels when the bottles remained in a car. Foreign natural water and domestic natural water have very few differences between them, despite the #prestige# of foreign water. Bottled water has higher chemical levels than non-bottled water and also has terrible environmental impacts. Several bottled municipal water brands, such as Dasani and Aquafina had no bacteria colonies develop. This leads me to assume that there are contaminants in the water that kill these bacteria. In future years I hope to test the chlorine levels of these waters, which would account for the lack of bacterial growth.</p>	
Summary Statement My project tested water purity of several different brands of water, as well as several sources of tap water.	
Help Received Parents bought the supplies	