



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Austin C. Beaulieu	Project Number J2101
Project Title Algae and Algaecides	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to find the most effective and economic algaecide to kill Volvox.</p> <p>Methods/Materials This project requires 20 7 ml Petri dishes divided into 4 quadrants, tap water, Volvox algae cultures for 100 students, lab coat, gloves, goggles, 1 μL pipette and 6 mL pipette, copper, chlorine, and BaquaCil, microscope 20x, and 96 μL pipette tips. To test this project you must get 1mL of volvox algae and insert into each quadrant of the Petri dish and counted. Then 6mL of water was inserted into each quadrant. 25 μL of copper algaecide was inserted into one quadrant. 25 μL of BaquaCil was inserted into one quadrant. 50 μL of Chlorine was inserted into each quadrant. After 8 hours algae would be counted again.</p> <p>Results Out of the three algaecides tested to kill Volvox, chlorine is the better algaecide because it kills all the algae and leaves no remains of algae to clean up. Chemical B is the second best algaecide because it kills all of the algae, but leaves whole remains of algae. Copper algaecide has almost no advantages because it kills 43% of the algae.</p> <p>Conclusions/Discussion Of three commonly used swimming pool algaecides, chlorine is the most effective and economic.</p>	
Summary Statement This project is about finding the best algaecide to kill Volvox.	
Help Received Prof. Dave Brunette and Prof. Michelle Garcia identified algae. Mrs. McKinny let me borrow supplies.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Jennifer A. Brenk	Project Number J2102
Project Title Sodium Labeling: Is What You See What You Get?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this investigation is to verify the accuracy of sodium labeling on several brands of taquitos. The researcher is seeking to verify whether the levels were within plus or minus 20% of the label statement as required by government guidelines.</p> <p>Methods/Materials Materials used for this experiment were one box of frozen chicken taquitos made by the following brands: Jose Ole, Delimex, El Monterey, and, Nuevo Grille; A Nelson Jameson M-926 salt meter; a gallon of distilled water; 20% salt-water solution; a microwave; a freezer; a stove; a blender; minimum of 20 coffee filters; 2 quart pan; 2 - 2 cup bowls; a thermometer that measures in degrees Fahrenheit; a food scale that measures in grams; and paper and pencil. A Nelson Jameson M-926 salt meter was used to measure the amount of salt in a 100gram water taquito mixture. Took the number from the machine and used formula to find the sodium in the mixture. Compared this number to the amount of sodium stated on the label.</p> <p>Results The variation in sodium levels within each test group (from test to test) ranged from 3% on Delimex to 4% on El Monterey to 9% on Jose Ole to 42% on Nuevo Grille. On average the variation between label and test results were 10% for Jose Ole, 31% for El Monterey, 17% for Delimex, and 14% for Nuevo Grille. In a separate independent lab test the variation was 15% for Jose Ole, 10% for El Monterey, 10% for Delimex, and 17% for Nuevo Grille.</p> <p>Conclusions/Discussion From the test results the researcher would conclude that three of the four tested brands of taquitos were within the 20% allowable variance thereby proving the hypothesis incorrect. The one brand with greater variance was actually under the label stated sodium level. However the variance in test results would demonstrate there are instances where the sodium levels do vary more than 20%. It is also likely that different testing circumstances can show different results as was seen between the researchers results and the external lab results.</p>	
Summary Statement Testing different brands of taquitos, to find the company who's labels are more accurate in sodium labeling.	
Help Received The Circle Foods Quality Assurance Staff helped me with the project set up, salt meter education, and setting up the testing. My father helped me with the whole project, and my mother helped me with the writing parts of the project and organization.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Claire E. Buchanan; Kelly E. Evans	Project Number J2103
Project Title Preventing Pumpkin Decomposition: The Effectiveness of Home Remedies	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to determine which home remedies prevent carved pumpkin decomposition the best (as measured by amount of mold and wall softness).</p> <p>Methods/Materials There were five conditions in this project. Four of the conditions were recommended (but un-tested) home remedies for preventing carved pumpkin decomposition including acrylic spray, petroleum jelly, bleach, and lemon juice. The fifth condition was a control group (no remedy). Fifty identical pumpkin samples were carved from 10 fresh pumpkins (5 Luminas and 5 Jack-O-Lantern) for this project. Ten samples (one sample from each pumpkin) were placed into each of the five conditions. Two ratings (amount of mold and wall softness) were made for each of the 50 pumpkin samples for 14 days. This resulted in a total of 1400 data observations.</p> <p>Results Overall, the petroleum jelly was the best remedy for preventing mold and wall softness. The other remedies appeared to increase decomposition. Yet, the control condition had better mold ratings than the petroleum jelly after day 8 and better wall softness ratings for the first 12 days. However, when the results were examined separately by pumpkin type, it appeared that the remedies worked better for the Lumina (white) pumpkins than they did for the Jack-O-Lantern (orange) pumpkins. Specifically, for the Lumina pumpkin samples, the petroleum jelly and bleach prevented mold better than the control and the acrylic spray and bleach prevented wall softness better than the control.</p> <p>Conclusions/Discussion These results suggest that petroleum jelly can be an effective home remedy in preventing mold. Several of the other recommended home remedies, including acrylic spray and lemon juice, actually seem to make the pumpkin decompose more quickly, especially for the popular Jack-O-Lantern (orange) pumpkin type. However, the type of pumpkin varietal seems to make a difference in whether a home remedy is effective in preventing decomposition and this is an important factor to consider in future research.</p>	
Summary Statement This project examined the effectiveness of using petroleum jelly, acrylic spray, bleach, and lemon juice to prevent carved pumpkins from decomposing (as measured by mold growth and wall softening).	
Help Received Father helped apply acrylic spray. Dr. James Farrar loaned the digital scales. Dr. Brian Tsukimura reviewed procedures to make sure we followed safety guidelines. Grandfather helped us fix a problem with the Excel formatting. Mothers helped with the printer (printing on photo paper) for the display	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Delia M. Bullock	Project Number J2104
Project Title Sweeten Your Knowledge: The Search for the Perfect Sugar Substitute	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine which artificial sweetener achieves the lowest calorie content without sacrificing taste.</p> <p>Methods/Materials One mass scale balance was used to measure 12 different types of sweeteners. Baker's Yeast, Ziploc plastic sandwich bags, and measuring cups were used to ferment the sweeteners. The amount of carbon dioxide produced when the sweeteners fermented demonstrated the relative amount of calories. The three sugars with the least amount of calories, as well as refined sugar as a base line, were used in a taste test. In the taste test, I recorded the responses of a group of 30 human subjects to samples of each sweetener. Subjects were asked to rate each sweetener on a sweetness scale of 0 -3 and whether they would use each sweetener.</p> <p>Results While most sweeteners produced significant amounts of carbon dioxide, Truvia, Purevia and Splenda showed almost no fermentation. On the taste test, sugar was by far the most popular, but Splenda performed the best out of the non-sugar sweeteners.</p> <p>Conclusions/Discussion Artificial sweeteners are a billion dollar industry with huge advertising campaigns that can sometimes be misleading. My results clearly show that three artificial sweeteners, Purevia, Truvia and Splenda, were most truthful about their calorie content whereas other sweeteners were not as accurate in their representations. Out of these three lower calorie sweeteners, Splenda was the most popular to human subjects.</p>	
Summary Statement This project focused on product testing of taste and calorie content in sugar substitutes	
Help Received Mother helped with setting up the statistical analysis and conducting the taste test. Father helped with setting up yeast test.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Ashlynn J. Burson	Project Number J2105
Project Title Dog's Drool: Is It Cool? Dog Saliva vs. Neosporin in Killing Bacteria	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine if dog saliva kills bacteria and to compare dog saliva to Neosporin in this process.</p> <p>Methods/Materials Petri dishes, agar, latex gloves, sterile cotton swabs, sterile distilled water, human saliva, dog saliva, and Neosporin were gathered. One petri dish was used as a negative control and contained no bacteria to show the agar was not contaminated. One petri dish was used as a positive control which only contained a swabbing of human saliva ("bacteria"). Two petri dishes contained the swabbing of human saliva ("bacteria") with the additional swabbing of dog saliva placed in the center of the dishes. Two other petri dishes contained the swabbing of human saliva ("bacteria") with the additional swabbing of Neosporin placed in the center of the dishes. The quantity/percentage of bacteria growing in each dish for five days was observed and documented.</p> <p>Results Dog saliva slowed down the quantity/growth of bacteria for a few days but still eventually grew bacteria. Neosporin not only prevented the growth of bacteria completely in the area applied, but it had a protective ring around it preventing the growth of bacteria, as well.</p> <p>Conclusions/Discussion Dog saliva may perhaps help slow the growth of bacteria for a little while, but it also may be adding its own bacteria when applied. Neosporin is the better medicine for helping kill bacteria. Neosporin not only proved to kill the bacteria but kept bacteria from growing at all.</p>	
Summary Statement This project was to determine if dog saliva kills bacteria and to compare dog saliva to Neosporin in this process.	
Help Received Mom assisted in typing the report, taking pictures, transporting me, and giving suggestions for the board display. Lorrie Burnham, Microbiology lab technician at Valley College, provided replacement agar, petri dishes, and sterile water for second procedure attempt.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Cameron W. Carpenter	Project Number J2106
Project Title Bacteria at Prep and What Cleaning Agent Best Inhibits Its Growth	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of the "Bacteria at Prep" project is to discover what bacteria lives in the Flintridge Prep environment and where this bacteria is commonly found within the school. Then perform tests to see which cleaning agents are most effective in inhibiting the growth of these bacteria.</p> <p>Methods/Materials For this experiment, I collected seven samples from six high-traffic locations at Flintridge Prep, which I believed would have the highest concentration of bacteria. Then, for each location, I allowed one Petri dish to grow as a control. The other six plates from each location were exposed to one of the following cleaning agents; bleach, hydrogen peroxide, Lysol, Purell, Simple Green, and Vinegar. This procedure was repeated for all six locations. After 72 hours, I observed and recorded how much bacteria had grown through the different cleaning agents.</p> <p>Results My hypothesis is that bleach will stop the growth of the most bacteria, because bleach contains a chemical called hypochlorite, which attacks the essential proteins in bacteria, and without these proteins, the bacterial cell will die. This hypothesis proved to be correct because bleach prevented the most bacterial growth out of all the cleaning agents.</p> <p>Conclusions/Discussion This project is very important because there are many different kinds of bacteria present in school environments, some of these strains of bacteria, in addition to being very dangerous, can be extremely contagious as well as drug-resistant. As a result it is vital to find the best way to detect, and ultimately to prevent the growth of harmful bacteria that live in schools.</p>	
Summary Statement How to locate where bacteria is found in a school environment and what cleaning agents best prevent its growth.	
Help Received Consulted with uncle on how to formulate experiment.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Jeffrey D. Chen	Project Number J2107
Project Title How Clean Is Your Water?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to test which method of purifying water is the best, filtering, iodine treatment, or solar treatment.</p> <p>Methods/Materials The main method I used for this project is the gram test which is a test that allows me to differentiate gram negative and gram positive bacteria as well as stain them. I also grew the bacteria using agar so that I will be able to see and identify the bacteria better. The materials I used were, a Brita Water filter, a glass bottle, three iodine tablets, liquid Gram's iodine, safranin, crystal violet stain, acetone alcohol, agar, immersion oil, medicine dropper, dimpled microscope slides, slide covers, 9 Petri dishes, a microscope, tap water, pond water, and a source of heat or a small fire.</p> <p>Results After completing the whole experiment, I found that the portable water filter did the best job in purifying the river water. The filtered water samples always had relatively less bacteria and the size of the bacteria was smaller as well. The iodine treated samples had a little more bacteria and they were larger. The solar treated samples had the greatest amount of bacteria and the largest bacteria compared to the other methods of purifying water. Therefore, I concluded that filtering was the best method of water purification.</p> <p>Conclusions/Discussion Based on the result of this experiment, my hypothesis was correct. What surprised me the most, however, was that the solar treatment did not disinfect the water as much as iodine. From my research, iodine did not seem like a reliable purifier. Instead, the iodine tablets purified the water almost as well as the filter. The tablets did turn the water yellow, however, so it would seem to be healthier to use a filter than to add chemicals to the water. This experiment is mostly directed toward campers who may not have a clean source of water to drink. Filtering, iodine tablets, and solar treatment are common ways for campers to purify water, but they may not know which method is the most effective. By doing this experiment, I have concluded that a portable water filter would be the best method for campers to purify river water. I would like to thank my parents and sister, who drove me around to buy materials, and the Ukiah High School biology teacher who allowed me to interview him and who loaned me a few materials that were vital for this experiment.</p>	
Summary Statement After testing the filter, iodine, and solar treatments affectiveness, I found that filtering purified the water the best.	
Help Received High school biology teacher allowed me to interview him and borrow some supplies.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Kimberly Chwalek; Elizabeth Sullivan	Project Number J2108
Project Title Cleansers vs. Bacteria: Which Will Win?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our science fair project tested to see if kitchen cleansers and hand sanitizers really kill 99.9 percent of bacteria like they claim.</p> <p>Methods/Materials We tested seven different kitchen cleansers and hand sanitizers. The names of these kitchen cleansers are Lysol, Clorox, Fantastik, Windex and the hand sanitizers are Purell, CVS pharmacy sanitizer, and Kroger sanitizer. In the first experiment of our project, we cultured different sections of our kitchen counter top. Then we treated each section with a specific product using it like people generally would, spraying the product then quickly wiping. We then re-cultured each section. After 48-72 hours, we compared the number of bacterial colonies on the blood agar plates of each section to their specific controls. In the second experiment, we used each product's specified contact times. We repeated the experiment but made sure the product stayed on the kitchen counter for its specified contact time. We then recultured each section. After 48 hours we compared the bacterial colonies and made an estimated percentage of how much each product killed.</p> <p>Results Our overall results show that Lysol came in 1st, killing 90-96% of bacteria, while Fantastik came in last killing 20-25% of bacteria.</p> <p>Conclusions/Discussion Our results show that none of these kitchen cleansers or hand sanitizers met their claims by saying they killed 99.9% of bacteria. Some of these products had an advantage because they had longer contact times. For instance, Clorox had a contact time of 2 minutes. Usually the average person doesn't leave the product on the surface for two minutes, they quickly spray and wipe.</p>	
Summary Statement Our project tested if kitchen cleansers and sanitizers really kill 99.9 percent of bacteria like they claim.	
Help Received Dr. Deb Robertson supplied us with blood agar plates and sterile q-tips and taught us how to inoculate culture plates.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Caitlinn A. Despot	Project Number J2109
Project Title Tylenol Brand vs. Store Brand Acetaminophen	
Abstract Objectives/Goals My project was to determine if name brand acetaminophen tablets, Tylenol, dissolve at a quicker rate than generic tablets. I believe name brand will dissolve faster and decrease uptake time. Methods/Materials Three types of tablets, name brand and generic, were selected. A simulated stomach acid was created from hydrochloric acid. The acid was heated to 98.6 degrees and the tablets were placed in the solution. A magnetic stirrer was used to simulate digestive actions in the stomach. The tablets were timed until they dissolved completely. Results The name brand tablets dissolved quicker in all tests. Further, the regular tablets dissolved quicker than the gel type tablets. Conclusions/Discussion My conclusion is that for the best results and quickest pain relief name brand tablets would be the best choice.	
Summary Statement My project was designed to determine if brand name tablets dissolve and go to work faster than generic tablets.	
Help Received My Mother, who is a nurse, mixed to the solution of acid and helped me put my board together.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Jessica Fang	Project Number J2110
Project Title Chunky Milk	
Abstract Objectives/Goals My project was to determine how much casein and whey protein would be produced from different types of Lucerne milk. I believe that whole milk will produce the most protein. Methods/Materials Five different kinds of Lucerne milk were used, along with the same amount and type of vinegar. They were whole milk, 2% milk, 1% milk, nonfat milk, and 100% lactose free whole milk. The mixture of milk and vinegar was microwaved for 1 minute. It was then filtered using a coffee filter and the protein was then weighed in grams. Each variation was done 10 times. Results 100% lactose free whole milk consistently had the most amount of casein and whey protein. Nonfat milk consistently had the least amount of protein. Conclusions/Discussion This experiment is not only testing which kind of milk produces the most protein, but also whether or not the protein amount stated on the milk cartons are true. The results show that 100% lactose free whole milk produced the most, whole milk, 2% milk, 1% milk, and nonfat milk had the least amount of protein. This shows that the more fat a milk contains, the larger the amount of protein is.	
Summary Statement This project is examining how different types of milk and their protein amount is affected by adding acetic acid and heat through microwaves.	
Help Received Borrowed a scale from a friend	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Jase J. Franke	Project Number J2111
Project Title Which Acne Cream Can Really Zap That Zit?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if over-the-counter acne creams or prescription acne creams are more effective at removing facial bacteria. I believe the prescription acne creams will be more effective than over-the-counter acne creams.</p> <p>Methods/Materials The variable of my experiment is that I tested 3 over-the-counter topical acne creams and 2 prescription topical acne creams. The over-the-counter creams were Proactiv, Clearasil and Neutrogena. The prescription acne creams were Duac and SFC which I obtained a prescription from my dermatologist. I tested the acne creams by using the bacteria Bacillus Cereus that I obtained from Carolina Biological. The bacteria was spread in Petri dishes. I spread each acne cream on the bacteria and conducted tests under the same conditions. I determined the most effective acne cream by taking 3 tests each and came up with 5 different ways to show how effective it is. I recorded the following: how far the acne cream has spread, how far the bacteria has spread, time for acne cream to go into effect, how long the acne cream lasted, and the percent of coverage.</p> <p>Results Proactiv, an over-the-counter acne cream was the most effective at killing the bacteria. Averages for Proactiv: 16.6 minutes to go into effect, lasted 3 hours and it spread 3.83mm. The bacterium spread 5mm and the percent of bacteria that covered the Petri dish was 83%. Duac came in second place, Neutrogena came in third place, Clearasil came in fourth place. SFC, a prescription acne cream, was the least effective at killing the bacteria. Averages for SFC: 32.6 minutes to go into effect, lasted 1 hour and it spread 1.5mm. The bacterium spread 4mm, and the percent of bacteria that covered the Petri dish was 79%.</p> <p>Conclusions/Discussion Acne cannot be cured but it can be treated. Modern medicine has produced a wide range of prescription and over-the-counter products to help people deal with acne. I can conclude that regular brand acne creams are more effective than prescription acne creams. My hypothesis was not correct because I thought prescription creams would be more effective. I had figured out that the acne creams with a better combination of ingredients are more effective at removing general facial bacteria. My project has a lot of value because it provides useful information to those who are fighting acne.</p>	
Summary Statement My project is to determine if over-the-counter acne creams or prescription acne creams are more effective at removing facial bacteria.	
Help Received Dr. Dunn, my science teacher, helped me order bacteria, Petri dishes and borrow test tubes from her.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Arman B. Ghazi	Project Number J2112
Project Title Hand Sanitizers vs. Bacteria	
Abstract Objectives/Goals The objective of this experiment is to investigate the effectiveness of different types of hand sanitizers and their active ingredients on various types of bacteria. I hypothesized alcohol-based hand sanitizers were more effective than non-alcohol based hand sanitizers and soapy water. Methods/Materials 70% isopropyl alcohol, Purell 65% ethyl alcohol, Germ-X 62% ethyl alcohol, herbal hand sanitizer, Cleanwell non-alcoholic hand sanitizer, and soapy water were tested on bacteria: E.coli, S.aureus, and E.faecalis. Antibiotic discs were placed in the hand sanitizers and placed in the center of the blood agar plate that was inoculated with bacteria. The bacteria were left in an incubator at a constant 36oC and were checked 24 hours later. Results Trial 1: The results were obtained by measuring the diameter of the circle of no growth around the antibacterial disc. Purell was best at preventing E.coli. Soapy Water, Purell, and 70% isopropyl alcohol was best at preventing S.aureus. Cleanwell was best at preventing E.faecalis. Trial 2: Purell and Germ-x were best at preventing E.coli. Purell was best at preventing S.aureus. Soapy water was best at preventing E.faecalis. 70% isopropyl alcohol was the best overall. Conclusions/Discussion The hypothesis was proven correct because the alcohol-based hand sanitizers were more effective than the non-alcohol based and herbal sanitizers. My hypothesis was correct for S.aureus and E.faecalis, because 70% isopropyl was the most effective and 65% ethyl was second best. However, for E.coli 65% ethyl alcohol was more effective and isopropyl alcohol was the second most effective	
Summary Statement Testing the effectiveness of hand santizers against different types of bacteria.	
Help Received Dr. Babakhani let me work in her lab	



CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s) Irfan S. Habib	Project Number J2113
Project Title The Investigation of Acetylsalicylic Acid, Sodium Bicarbonate, and Calcium Carbonate	
Objectives/Goals Does the amount of acetylsalicylic acid in various brands of aspirin tablets depend on the price of the aspirin tablet? Are CaCO ₃ (calcium carbonate) antacids or NaHCO ₃ (sodium bicarbonate) antacids more efficient in neutralizing stomach acidity? Does the strength of the base within an antacid depend on the price of the antacid?	
Abstract Methods/Materials A: Titration of Ammonia and Vinegar to obtain basic understanding of titration. B: Titration of aspirin and ammonia was performed to determine the normality (which is the concentration of H ⁺ per 1 L of solution) of each aspirin brand. C: Titration of antacid tablets and vinegar was performed to determine the normality (which is the concentration of OH ⁻ per 1L of solution) of each antacid brand. D: Added antacid to 0.5M HCl 1g at a time and recorded pH after each gram was added in order to determine which antacid brand increased the pH of solution at a faster rate.	
Results A: Normality of Ammonia= 1.06 Normality of Vinegar = 0.83 B: St. Joseph's was the most expensive aspirin and the Rite Aid brand was the least expensive; however, Ecotrin was the 3rd most expensive and it had the greatest H ⁺ content. The Rite Aid brand had the least amount of H ⁺ content. C: Alka-seltzer was most expensive antacid and Equaline was the least expensive. The Alka-seltzer and Rite Aid brand of antacids had greatest amount of OH ⁻ content (both had NaHCO ₃) and the Equaline (contained CaCO ₃) had least amount of OH ⁻ . Maalox (contained CaCO ₃) was the 2nd most expensive brand but had low OH ⁻ content. D: Alka-seltzer and Rite Aid brand acted the fastest when neutralizing acidity. The Equaline acted the slowest when neutralizing acidity.	
Conclusions/Discussion The amount of acetylsalicylic acid in various brands of aspirin does not depend on the price of the aspirin tablet. Although there was a general trend of more expensive brands containing more acetylsalicylic acid, Ecotrin was found to have the most acid even though it was not the most expensive. NaHCO ₃ antacids are better than CaCO ₃ antacids in neutralizing acid. The strength of the base within an antacid does not	
Summary Statement The purpose of this project is to determine if the amount of acetylsalicylic acid in aspirin tablets or the amount of sodium bicarbonate and calcium carbonate in antacid tablets depend on the price of the item.	
Help Received Sister explained the chemistry background	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Esther N. Hills	Project Number J2114
Project Title What Is the Best Way to Clean a Stuffed Animal of Both Dirt Particles and Bacteria?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My goal was to learn what method cleaned stuffed animals of dirt and bacteria the best.</p> <p>Methods/Materials I used 15 stuffed animals (5 for the control group and 10 for testing), 25 Sheep's Blood Auger plates, a microscope, flower bed dirt, and 10 different products for cleaning. I rolled my 10 stuffed animals in the dirt. Then I swabbed them using the travel swabs. Then I inoculated my auger plates. Afterward I incubated the plates for 24 hours and the next day I counted the bacteria spores. Then I disposed properly of my plates. The second way I found my data was the microscope part of my project. I cut fibers off all 10 of my stuffed animals before and after they were cleaned. I counted dirt particles, under a microscope from fibers cut off of all 10 bears and I drew pictures of what I saw. I cleaned the stuffed animals using the following methods: 1) Nothing, 2) Clorox Disinfectant Wipes, 3) Vacuum Hose, 4) Baking Soda & Water, 5) Freezer Bag in Freezer, 6) Washing Machine, 7) Febreze, 8) Dryer 9) Isopropyl Rubbing Alcohol, and 10) Salt Water Bowl. After cleaning, I repeated the processes for counting bacteria and dirt particles and compared the before and after results. In the end, the cleaning product that worked the best was the one with the least amount of dirt particles and bacteria.</p> <p>Results After cleaning 10 different ways, for the bacteria part of my experiment, 2 of the stuffed animals had 0 bacteria spores, 2 had 1 bacteria spore, 2 had 3 and the rest had in between 13 and 21 bacteria spores. For the dirt particles part of my experiment, one of the stuffed animals had 4 dirt particles, one had 5, one had 9, the rest were in between 11-50 dirt particles.</p> <p>Conclusions/Discussion Clorox Disinfectant Wipes and freezing the stuffed animal in the freezer were the best ways to kill bacteria. Both methods had 0 bacteria spores after the cleaning was done. The washing machine and Clorox Disinfectant Wipes were the best ways to get rid of dirt particles. The washing machine had 4 particles after cleaning and the Clorox Disinfectant Wipes had 5. These data suggest that Clorox Disinfectant Wipes is the best way to clean a stuffed animal for both dirt particles and bacteria. This was different from my hypothesis because I thought the washing machine would be the best cleaning method, but the washing machine was only the best way to get rid of dirt particles.</p>	
Summary Statement Of 10 methods, my project finds the best way to clean a stuffed animal for both dirt particles and bacteria.	
Help Received Science teacher and adult volunteer supervised lab work. Friends helped inoculate, incubate and dispose of auger plates. Mom helped with typing and setting up my board.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Yusuf A. Khan	Project Number J2115
Project Title Cloudy with a Chance of Bacteria	
Objectives/Goals I was trying to determine which mouthwash protected your mouth from cavities the best. I tested four agents:Crest,Scope,Listerine & Hydrogen Peroxide.	
Abstract Methods/Materials First, I let my agar plates reach room temperature Then, I used a swab to transfer the streptococcus mutans in the culture tube into the tube with Muellers broth. I made sure the broth looked cloudy which ensures there is enough bacteria in the broth. I used a sterile calibration loop to streak 0.001 ml of the broth onto each plate. A separate loop was used for each agar plate Then, I added an amount of each mouthwash to each agar plate-Trial 1: 5cc, trial 2: 0.5cc, trial 3: 0.5cc (I put the agar plates into a pre-made incubator) I counted and recorded the number of colonies of bacteria (S. Mutans) after 24 hours and 48 hours Materials: Agar plates,Streptococcus Mutans,Styrofoam box,lamp,thermometer,Mouthwashes(Crest,Scope,Listerine),Hydrogen peroxide, Inoculation loops, Muellers broth,Sterile gloves&swabs,Camera	
Results I observed that wherever I applied the oral cleansing agent, barely any bacteria grew; but wherever I did not put any, a lot of colonies formed. This shows that all the agents were strong enough to inhibit the growth of many colonies. If the proper amount of any of these was put in your mouth everyday you would have a bacteria free mouth. It is just that Crest is the most concentrated.	
Conclusions/Discussion My hypothesis was correct in both experiments. In experiment one, Crest had more colonies but they grew outside the zone of inhibition. By zone of inhibition I mean the area where the mouthwash was applied. In Crest's zone of inhibition, there was not a single colony, unlike all the other mouthwashes. In hydrogen peroxide, there was one colony but it was in the zone of inhibition. In experiment two, Crest killed 1% more than the second place agent which was hydrogen peroxide. This made Crest the best at killing already living bacteria. So in this experiment it shows that the best agent to use on your mouth is Crest mouthwash. If I were to do this experiment again I would have more trials. Also I would spread the mouthwash evenly over the whole agar plate to ensure consistency and accuracy.	
Summary Statement I am trying to find out which oral cleansing agent will inhibit/kill bacterial growth and stop the formation of cavities.	
Help Received Mother helped get materials; Father supervised experiment and helped design the board	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Grace M. Kiralla	Project Number J2116
Project Title Moldy Fruit, Anyone?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of the experiment is finding out whether or not nano-technology boxes, such as the Kinetic Go Green box, really work better than traditional storage methods. What I am trying to figure out is if the boxes do keep foods fresh for a longer amount of time, or if the other leading brands store food for a longer time. No one has found one solid answer to the prevention of spoilage, but that is what I am attempting to do in my science fair project.</p> <p>Methods/Materials</p> <ol style="list-style-type: none">1. A refrigerator set to 33 degrees Fahrenheit2. One 2.5 gallon Kinetic Go Green Food Storage Container3. One 1.3 gallon Rubbermaid Tupperware container4. One single gallon Ziploc Bag5. Three boxes of unwashed California Well-PicT Strawberries6. Any writing materials needed to make observations about the berries <p>Results The results of my experiment were as follows. The Rubbermaid Tupperware container demonstrated rot after 8 days, the Ziploc bag demonstrated rot after 10 days, and Kinetic Premium demonstrated rot after 12 days. The rubric for rot was a five point scale, ranging from one being normal, to five being moldy. My hypothesis predicted that the nano-silver technology container would be the best, which it was. However, the Ziploc and the Tupperware were not as i predicted. The Ziploc was superior.</p> <p>Conclusions/Discussion My experiment was to find out if the Kinetic Go Green Premium Food Storage Container keeps food fresh for a longer time rather than the other methods. The Kinetic container did keep food fresher. When I started my experiment, I thought that the food inside of the Ziploc bag would spoil faster than the others. It turned out that the strawberries inside of the Rubbermaid Tupperware started to rot first, then the Ziploc, and then finally, the Kinetic Go Green box. If I could do anything differently about my experiment, it would be to select a specific breed of strawberry with a very large sample size. I also think that the experiment might be different if the strawberries surface areas were very similar. I was unable to determine if ethylene gas release is different by breed or by size of strawberry. In that way, individuals could better predict the decline of the foods to reduce waste.</p>	
Summary Statement My experimental purpose is to find the best and most efficient way to store food.	
Help Received Father helped understand concepts, Ms. Hiss helped guide me to the right recourses and helped me refine my question	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Monica Bach Le	Project Number J2117
Project Title Examining the Sanitary Rates of Antibacterial Cleaners through the Use of Bacillus subtilis	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective is to examine which antibacterial cleaner has the highest sanitation rate as measured by exposing the antibacterial cleaners to Bacillus subtilis.</p> <p>Methods/Materials All the needed materials for my experiment is agar plates, a graduated cylinder, pipettes, flasks, a beaker, a glass bent rod, a lighter, a culture dish, a pair of gloves, an agar plate of Bacillus subtilis, Methanol, Formula 409, Windex, Lysol, Distilled water, a cotton swab, a pair of scissors, a Sharpie, and an incubator. The methods for my experiment are to first pour 600 mL of Distilled water into a beaker and then pour 150 mL into four (4) flasks. Second, pour ten (10) mL of the correct chemical into the correct flask. Next, label all the agar plates with the correct trial number and chemical name. After, take a glass pipette to measure the substance and then release the substance onto the center of the agar plate. Then sanitize the glass bent rod with a lighter and then use the rod to spread the liquid evenly on the agar. Last, place all the finished agar plates in the incubator. After 24 hours, take the agar plates out to count the colonies and record the results.</p> <p>Results The results of my investigation on which antibacterial cleaner has the highest sanitation rate indicates that Formula 409 was the most sanitary cleaner, and Distilled water was the least sanitary cleaner. In order of most sanitary to least sanitary is Formula 409, Lysol, Windex, then Distilled water.</p> <p>Formula 409: least-0, greatest-23, and average-8.68 Lysol: least-19, greatest-98, and average-60.9 Windex: least-48, greatest-185, and average-87.13 Distilled water: least-53, greatest-294, and average-153.68</p> <p>Conclusions/Discussion In conclusion, I successfully found the results of my investigation. I also learned several things along the way of creating this project such as: learning how to spread bacteria on agar plates, sanitation methods, and how to properly grow colonies. Although there are positive aspects of my project, others may ask, how does my project help others? Having the knowledge of which antibacterial cleaner actually works will help families and others to keep their surroundings sanitized. With properly sanitized surroundings, it will help children, adults, and elders to stay away from harmful bacteria and stay healthy.</p>	
Summary Statement I am investigating how sanitary a variety of antibacterial cleaners are by exposing them to Bacillus subtilis.	
Help Received Mother provided transportation to needed destinations and putting the board together; Mr. Whittington taught sanitizing methods.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Primavera Leal-Martinez	Project Number J2118
Project Title The Effects of Different Beverages on Reducing the Calcium Levels of Eggshells	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to investigate the effects of beverages on tooth enamel. I believe that orange juice with a ph balance of 3.5, will reduce the calcium levels of eggshells the most.</p> <p>Methods/Materials I used eggshells to simulate tooth enamel since both are calcium based. I first removed the yolks and albumen from 50 eggs. The eggshells were rinsed in tap water and allowed to dry for 72 hours. I separated the eggshells into 5 bags of 10, then weighed each bag in grams recording the results. I then removed the egg shells from the plastic bags and transferred each group into one of 4 plastic containers. I poured 10 cups of orange juice into one of the containers. I repeated the same process for coffee, tea, and Pepsi. I used distilled water as the control. After soaking the eggshells for 48 hours, I rinsed each group of eggshells and allowed them to dry for 72 hours. The eggshells were then reweighed and the difference again recorded in grams.</p> <p>Results My results showed that Pepsi was the beverage that had the greatest difference between the two weights. The eggshells soaked in Pepsi decreased in weight by 6.14 grams. Of the variables, coffee was the beverage that had the least decrease in weight 1.43 grams. All the test variables that I used had a decrease in weight. The control, distilled water, had a decrease of 1.12 grams. I found that my hypothesis was incorrect. My results showed that Pepsi was the beverage that had the greatest difference between the two weights. The eggshells soaked in Pepsi decreased in weight by 6.14 grams. Of the variables, coffee was the beverage that had the least decrease in weight. All the test variables that I used had a decrease in weight. .</p> <p>Conclusions/Discussion I found that my hypothesis was incorrect. Orange juice did not cause the greatest reduction of calcium in the eggshells. My results showed that Pepsi was the beverage that had the greatest difference between the two weights. I learned that some beverages, more than others, could be unhealthy to tooth enamel. Pepsi is the beverage that will do the most harm to your teeth. People should be aware that some beverages will cause acid erosion if consumed over a long period of time. Consumers should be selective about the beverages they choose to drink.</p>	
Summary Statement The effects of different beverages on reducing the calcium levels of eggshells and how it may relate to tooth enamel.	
Help Received High School Biology teacher let me use his scale.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Zachary Leitzel	Project Number J2119
Project Title Does Orange Oil Really Work? A Study of Synthetic vs. Organic Pesticides	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals One serious threat to the preservation of our streams, lakes, and ocean is pesticide run-off. Long-lasting synthetic pesticides that are sprayed throughout California can be washed away by rain and irrigation, causing a harmful run-off of pesticides that has dramatic effects on fish and aquatic birds. My goal was to determine if organic pesticides that have been introduced to the professional pest control industry over the past decade could compete with synthetic pesticides. These new natural pesticides, like Orange Oil and Mint Oil, are not being used very much by most professional exterminators. I wanted to find out if they did as good a job as the synthetic pesticides. My hypothesis was that synthetic pesticides would outperform the organics.</p> <p>Methods/Materials After interviewing industry professionals I tested the two factors that were important to them in choosing a pesticide, initial knock-down and residual effectiveness. To test knock-down I directly treated 4 groups of 15 test subjects (crickets) with 2 synthetic and 2 organic pesticides. To test residual effectiveness I treated a test board with 1 synthetic and 1 organic pesticide then exposed groups of 15 test subjects to each section of the treated board at 1 and 7 day intervals. All experiments were duplicated for accuracy and control groups were used to rule out unforeseen errors. In total 330 crickets were tested. 270 were exposed to treatments in the experiments and 60 were in control groups.</p> <p>Results As expected, the synthetics outperformed the organics in residual effectiveness, but the Mint Oil showed even better knock-down than the synthetics.</p> <p>Conclusions/Discussion Overall, synthetic pesticides outperform organic ones. However, if a professional exterminator company wanted to offer a service utilizing only organic pesticides, they could reasonably do it. They would probably just need to visit the property more frequently; monthly instead of every other month. With further scientific development, we may one day see organic pesticides completely replace synthetic ones, much to the benefit of our environment.</p>	
Summary Statement My project compares the effectiveness of some selected synthetic pesticides vs. some of the new organic pesticides to determine if the organic pesticides can replace the synthetics and help improve our impact on the environment.	
Help Received My father helped me print out pictures and charts. My mother helped me purchase all the materials I needed for my experiments and my presentation board.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Claire A. McClain	Project Number J2120
Project Title Controlling Mold on Untreated Drywall with Common Household Products	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine what single, common, household product kills or impedes mold growth effectively and efficiently. I hypothesized that the 70% isopropyl rubbing alcohol would work the best at killing or impeding mold growth. The independent variable is the solution used to test the mold growth. The dependent variable is the growth of mold.</p> <p>Methods/Materials Introduced mold samples, grown from a pumpkin, to ten 4cm x 4cm squares of untreated drywall contained in Petri dishes and moistened each with bottled drinking water. One gram of each dry substance (baking powder, baking soda, salt, borax, and sugar) was dissolved in 50 mL of bottle drinking water. After the mold grew for 72 hours, I introduced 3mL of each solution of baking powder, baking soda, salt, borax, sugar, rubbing alcohol, hydrogen peroxide, distilled white vinegar, and lemon juice to the mold (one solution per Petri dish). I observed their reactions over a 48 hour period by measuring the mold specimen and recording my results at 24 hour intervals.</p> <p>Results Rubbing alcohol worked the best at impeding mold growth. Some of the other products that did not work as well, may have worked better in combination with other products or in different physical states, as suggested by my research.</p> <p>Conclusions/Discussion My conclusion was that the 70% isopropyl rubbing alcohol worked the best at killing or impeding mold growth. This experiment was a good place to start in finding a cost effective and efficient household product that kills or impedes mold growth. Further experiments could be conducted using different concentrations, different combinations of products and different physical states. Finding the right mixture of these household items could lead to an effective and easy to use product, since these items are typically found in most homes.</p>	
Summary Statement My project is about what common household product is the most effective at impeding mold growth on untreated drywall.	
Help Received Mother supervised the cutting of drywall and handling of mold specimen. Father advised me on scientific methods. Ms. Thacker and Mr. Martinez (school science teachers) provided guidance and equipment for my project.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Frida A. Montoya	Project Number J2121
Project Title Which Antibacterial Wipe Brand Will Kill the Most Bacteria?	
Abstract Objectives/Goals My project is to determine which antibacterial wipe brand is better for killing bacteria. I believe that the antibacterial wipe brand with the greater amount of Clorox will be the most successful in doing so. Methods/Materials Three different brands of antibacterial wipes (Green Works, Supreme Clean, Clorox) were tested in killing the same kind of bacteria. The bacteria was put on a Petri dish along with unflavored jell-o. The bacteria was collected from a dirty dog bowl. The unflavored jell-o was dissolved with hot water. Then, a layer of the dissolved jell-o was poured to cover the bottom of each Petri dish. Once the bacteria was set in each of the Petri dishes it was left in a warm, undisturbed place so that bacteria were able to grow. After the bacteria grew, it was observed through a microscope. Then, each antibacterial wipe brand was tested in killing the bacteria. All of the antibacterial wipe brands had their own set of bacteria and were tested for three days. Five drops of the antibacterial wipe brand juice was put on the Petri dish to kill the bacteria then, the number of bacteria that were alive and dead were recorded the next day. After three days results were drawn by averaging the number of bacteria dead from each antibacterial wipe brand. Results The antibacterial wipe with the greatest number of bacteria killed (on average) was Clorox, with 20 bacteria killed. Green Works and Supreme Clean tied together, for second, at 14 bacteria killed. Conclusions/Discussion In conclusion, antibacterial wipes with the greater amount of Clorox are more useful in killing bacteria.	
Summary Statement This project tests the ability of antibacterial wipe brands (Clorox, Green Works, Supreme Clean) in killing bacteria.	
Help Received Mom and Dad bought my materials; Ms. Sumner let me borrow some scientific instruments.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Siena M. Okomo	Project Number J2122
Project Title The Effectiveness of Various Medications at the Eradication of Bacteria	
Abstract Objectives/Goals The objective of this experiment was to determine whether natural remedies or Western medication is more effective at the eradication of bacterial growth. Methods/Materials Forty Petri dishes were prepared with nutrient agar and inoculated with infected water. Paper disks were treated with four remedies: Bactine™, Calendula Gel, Bacitracin, and tea tree oil, two antiseptics and two antibiotics with one Western and one natural remedy per group respectively, and placed in the center of each Petri dish which then grew for seven days. The diameter of area without growth was measured and compared. Results This experiment had no decisive conclusion but Bactine, was more effective for antiseptics with a 1.4 mm diameter while Calendula Gel only had 0.3 mm. Bacitracin, the Western antibiotic did not work at all but tea tree oil was 0.8. Conclusions/Discussion The failure of the Western antibiotic may have been due to a bacterial resistance. To obtain a valid conclusion that could be applied to everyday life, all the products must show some type of eradication.	
Summary Statement To compare the effectiveness of natural remedies to Western medication in the eradication of bacterial growth.	
Help Received N/A	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Hannah M. Olson	Project Number J2123
Project Title Which Acne Medication Really CAN Zap That ZIT?!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Which Acne Medication Really CAN Zap that Zit? Because acne is bacteria-based, the experiments in this project involved growing two types of bacteria, and observing which reagent it reacted to the best. This was done by growing two blood agar Petri dishes of E. coli, one Petri dish of staphylococcus epidermidis per reagent, plus one control for each, then proceeding to place them in a homemade incubator, checking twice a day for growth progress, then measuring the growth resistance perimeter caused by the reagent</p> <p>Methods/Materials My hypothesis was tested by growing two blood agar Petri dishes of E. coli, one Petri dish of staphylococcus epidermidis per reagent, plus one control for each, then proceeding to place them in a homemade incubator, checking twice a day for growth progress, then measuring the growth resistance perimeter caused by the reagent</p> <p>Results Interestingly, my experimental results both did, and did not support my hypothesis, which stated that clindamycin would work the best to eliminate the infecting bacteria. While the E.coli bacteria hardly reacted to the reagent at all, the staphylococcus epidermidis showed large signs of growth resistance. For the E.Coli, Salicylic Acid came in first, and next came Clindamycin, followed by Benzoyl Peroxide and tretinoin Gel. In the Staphylococcus Epidermidis test, Clindamycin came first, Then Benzoyl Peroxide followed by Salicylic Acid then Tretinoin.</p> <p>Conclusions/Discussion The information gained from the experimental data of this project could be used by: doctors, who would like to prescribe the best acne medication to their patients struggling with it, teenagers with mild acne who are looking to reduce it, or people of all ages struggling with acne, or who have oily, acne-prone skin, and would like to reduce the risk of getting acne. Although the results of this project do not completely support my hypothesis, they have given me a great deal of knowledge on acne and the medications that can cure it. from the data I gained, I am able to resolve that, for mild cases of acne, I definitely recommend Salicylic acid, especially by my own good experience with this medication.</p>	
Summary Statement Finding the best of four acne medications.	
Help Received My stepmother, for helping me with the inoculation technique, overseeing safety and sterile process, and for helping order the supplies.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Leah M. Ostermann	Project Number J2124
Project Title That's the Pits	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment is to determine what preservatives keep fruit from turning brown the longest.</p> <p>Methods/Materials Pureed apple, banana, & avocado (480 mL each) were measured into 6 separate containers (3 trials each). Then 2.5 mL of each preservative (salt, sugar, lemon juice, avocado pit, & vegetable oil) were measured separately into the fruit & stirred. As the control, one container of each fruit did not contain any preservative. The color of the fruit was measured at similar time periods over the next 2 days using a color scale.</p> <p>Results Salt was the best preservative for apples by far. Even 2 weeks after the start of the experiment, the apples did not turn brown. Lemon juice & salt in bananas slowed the browning a little more than the other preservatives. For avocados, none of the preservatives slowed the browning. Adding salt to avocados increased the browning even more than with no preservative. The avocado pit, sugar, oil, & control all gave about the same results for all 3 fruits.</p> <p>Conclusions/Discussion When fruit is peeled or cut open, oxidation occurs. Oxygen reacts with the iron-containing phenols in the fruit. The oxidation forms sort of a rust on the surface of the fruit to cause browning. Fruit also contains natural enzymes in the cells. Pectolytic enzymes bring about a gradual ripening of fruit causing it to become softer by breaking down the cell walls. Enzymes act as catalysts for the oxidation reaction or speed up the ripening or browning of the fruit. Both physical and chemical methods inhibit oxidation typically by denaturing the enzyme.</p> <p>My hypothesis that lemon juice is the best preservative was not proven. Because each fruit has different enzymes that act as catalysts to speed up the browning, no one preservative will denature (break down) all the enzymes in all fruits the same. For example, salt denatures the enzyme in the apple the most probably by removing water from the cells. Without water the enzyme denatures & the apple doesn't brown. But salt browns the avocado the fastest. So salt somehow helps the enzyme brown the avocado. The experiment proves the research that using an avocado pit to keep avocado from browning is a myth.</p>	
Summary Statement This project determines which preservatives prevent browning in fruit the best.	
Help Received My parents helped with the procedure. My Mom helped with the graphs.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Francisca M. Perez	Project Number J2125
Project Title Sugar Substitutes and Tooth Decay	
Abstract Objectives/Goals Americans are using sugar substitutes more and more for health issues, dieting and preventing tooth decay. When people use these so called healthy sweeteners, could they have negative effects? The purpose of this experiment was to find out if the sweetener in different sugar substitutes affect the progression of tooth decay. My hypothesis stated that the sweetener in different sugar substitutes would affect the progression of tooth decay. This is because sugar substitutes are made from very different ingredients. Methods/Materials My materials included: 6 human teeth, 250 ml glass jars with lids, 200ml purified water per jar, 25g of sucrose, 25g of sucralose, 25g of saccharin, 25 g of aspartame, 25g of stevia, a 100 ml graduated cylinder, a 350 ml plastic measuring cup, an electronic balance, latex gloves, plastic tweezers and pins. I obtained approximately 30 teeth from local oral surgeons. I inspected each tooth and selected 6 teeth with no signs of tooth decay. I placed four of the teeth in different solutions made with water and sugar substitutes. I placed one tooth in a sugar solution and one in water. I soaked all six teeth for 12 days, removing the teeth every three days to check for signs of tooth decay. I checked the weight, volume, hardness and appearance of the teeth. Results Some of the teeth began to show signs of tooth decay after only three days. Signs of tooth decay included soft spots, discoloring, peeling of the enamel and changes in the weight of the teeth. Conclusions/Discussion My hypothesis was proven valid. The results of this experiment showed that each sweetener affected the teeth differently. I believe this experiment is very relevant to society because many people use artificial sweeteners as an alternative for sugar. The results prove that although these sweeteners may be a better choice than sugar, they still may pose a health concern.	
Summary Statement The central focus of this project is to find out if the sweeteners in different sugar substitutes affect the progression of tooth decay.	
Help Received Dentist recommended oral surgeons to approach for teeth; 3 oral surgeons donated teeth; parents helped purchase supplies; used Aptos Junior science lab and equipment	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Jordan L. Pluchar	Project Number J2126
Project Title Swine Flu Sanitizers: Truth or Hogwash?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to discover which form of hand sanitation is the most effective in killing bacteria. I was curious to determine if many of the product claims were actually correct.</p> <p>Methods/Materials I used sixteen petri dishes filled with agar and eight different cleaning products. The different sanitizing products I used were Up & Up, Purell, Cvs Foam, wipes, rubbing alcohol, bar soap, soft soap and water. I would then infect my hands on common surfaces (countertop, light switch, door handle and trash can lid) and would take a sample of how much bacteria was on my hands. Once I did this, I would clean my hands with each cleaner and sample how much bacteria was left on my hands. I repeated this process for all the sanitizers.</p> <p>Results I found that seven of the eight sanitizers that I used (Up & Up, Purell, Cvs Foam, wipes, rubbing alcohol, bar soap and soft soap) cleaned all the visible bacteria off my hands. The only "cleaner" that did not work by killing bacteria was a water rinse.</p> <p>Conclusions/Discussion I concluded that seven of the eight cleaners killed all the bacteria. Although, I did find some bacteria colonies growing in the rubbing alcohol petri dish. From my observations, the colony appeared to come from airborne bacteria. From these results, I could not effectively decide which cleaner was the best, so I took into account the price and convenience of the products. After I thought about these new factors, I considered that the Cvs Foam and rubbing alcohol were the best sanitizers. Although I considered these products the best choices, I discovered that many of the product claims were actually correct.</p>	
Summary Statement My project was to discover the most effective and least expensive way to clean bacteria off your hands.	
Help Received Dad helped kill the bacteria with me, show me how to spray paint board, distribute agar in petri dishes, help swab my hands	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Ariana N. Rupp	Project Number J2127
Project Title Does Lip Gloss/ Balm Increase the Ability of Ultraviolet (UV) Light to Kill Saccharomyces cerevisiae (Yeast)?	
Abstract Objectives/Goals To determine if lip gloss/ balm will increase the ability of ultraviolet (UV) light to kill Saccharomyces cerevisiae. To compare the abilities of various lip glosses/ balms to provide protection against UV exposure by comparing their abilities to protect Saccharomyces cerevisiae from UV exposure. Methods/Materials For each product the surfaces of Sabouraud dextrose agar plates were inoculated to contain approximately 50-100 cells of a UV sensitive strain of Saccharomyces cerevisiae. Lip glosses/ balms were then spread across the surfaces of lids of Petri dishes which were placed on the inoculated plates. Plates were then exposed to UV light (254 nm) for 30 seconds and for 4 minutes. After being exposed the lids containing gloss/ balm were removed and were then replaced with clean lids. Plates were incubated for 72 hours at room temperature. After incubation the number of colonies on each plate were counted and recorded. Results were compared to control plates, containing no lip gloss/ lip balm, that were exposed to the same conditions. Results Test results indicated that there were differences seen between the products. Better protection was displayed by the products that contained higher SPF ratings. Test results indicated that lip gloss/ balm did not increase the ability of UV light to kill yeast. Conclusions/Discussion Even though lip gloss/ balm did not increase the ability of UV light to kill yeast, data generated shows that different products provide different degrees of protection. Consumers should therefore use caution and select lip care products with high SPF ratings.	
Summary Statement To determine if lip gloss/ balm will increase the ability of ultraviolet (UV) light to kill Saccharomyces cerevisiae.	
Help Received My teacher, Mrs. Donna Harbison, and my parents helped guide me in designing my experiment and offered suggestions. My parents proofread my poster and report.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Matthew T. Shepherd	Project Number J2128
Project Title Goodbye Germs!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my project is to learn if antibacterial soap does or does not inhibit the growth of bacteria and to find if regular soap stops bacteria from growing as well. My hypothesis was: If I grow bacteria in a petri dish and then add antibacterial soap to it, then the bacteria will cease to grow or die.</p> <p>Methods/Materials To test my hypothesis I devised a procedure that required 1 cup of spoiled milk, an inoculation rod, a gas burner, antibacterial soap, regular soap, water, 20 prepared petri dishes and a camera. I first inoculated 15 petri dishes (leaving 5 for control) and let the dishes sit in my computer closet (which was heated to about 100 degrees fahrenheit) for 40 hours to grow bacteria. I then, treated 5 dishes with diluted anti-bacterial soap, 5 with diluted regular soap and 5 with water to see what would happen to the continued growth of the bacteria. To record my results at somewhat regular intervals I photographed all the petri dishes. After 141 hours counted up all of the noticeable bacteria colonies and graphed them.</p> <p>Results The data made it clear that although the antibacterial soap did not stop all of the bacteria from growing, it was the most effective liquid to inhibit the growth of the bacteria.</p> <p>Conclusions/Discussion From this project I have learned that if you wash your hands with antibacterial soap, then there will likely still be some live bacteria on your hands. The antibacterial soap does, however, slow the growth of bacteria on your hands. I have also learned that when you add liquid soap to a petri dish with growing bacteria, then the soap will bleach all of the nutrients within the perimeter of the liquid soap's spread. I find it very interesting that all of the sheep's blood in the agar on the petri dishes was bleached when I added the soap to the petri dishes.</p>	
Summary Statement My project tests the killing capability of antibacterial soap on milk bacteria.	
Help Received My father helped take the pictures and supervised me when I used the gas burner.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Yesmeen W. Shindy	Project Number J2129
Project Title Meat Keeper	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to see whether salt, cumin, or lemon juice preserved meat the longest.</p> <p>Methods/Materials Some materials I used were, Precision food scale, 16 ice cube trays, three pounds of beef for stew meat, and four large Styrofoam iceboxes. I kept each piece of meat in a ice cube tray(categorized by the different preservative) to avoid cross contamination. I, then placed all the ice cube trays in iceboxes. The iceboxes were room temperature which was 20 degrees Celsius. I kept the iceboxes consistantly at room teperature so I could get the same results and to speed up the process of meat decay, due to the fact of time constraints. Everyday, I would check the meat at 7:00 A.M. and 7:00 P.M. After all of the meat went bad, I came up with my results.</p> <p>Results In my results I found that salt did the best. Salt lasted ten days, cumin lasted six days, lemon juice lasted four days, and control lasted two days. This is because salt inhibits the growth of bacteria and mold, while cumin and lemon juice don't. Salt, also did the best because it drew water out of the meat through osmosis (which is the balancing out of water)and for there to be any bacteria or mold there has to be moisture and there was not alot of moisture after the salt.</p> <p>Conclusions/Discussion My question was, "what is the best natural meat preservative:salt, lenon juice or cumin?" My hypothesis was that salt would be the best preservative. My hypothesis was correct because the salted meat lasted the longest. It was the last preservative to remain untouched. The relevance of my experiment to everyday life is that, if you have frozen meat on your counter that you need to thaw overnight sprinkle some salt on top so no bacteria or mold start to grow on it. One problem I did have were time constraints. I did not have the full amount of time to conduct my experiment, to fix this problem I placed the meat in Styrofoam iceboxes at room temperature so that the meat rotted faster. Another problem was when the meat would go bad, I could only tell this by looking at it or smelling it. I understood from the beginning that smelling or visually insepecting the meat would be subjective and hard to prove. This project was very fun and educational. Even when I hit bumps in the road it was a good experience.</p>	
Summary Statement My project is about would salt, lemon juice, or cumin preserve the meat the best.	
Help Received Parents bought materials for project, Teacher guided in paper	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Kapil Sinha	Project Number J2130
Project Title Branded vs. Nonbranded: What Is More Effective? Search for the Best Allergy Relief Medicine	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose for my experiment was to find out which allergy medicine dissolves fastest in the stomach. I came up with this idea because my mom has allergies and takes different kinds of medicines. I wanted to know which medicine would dissolve the quickest and would give my mom the quickest relief. I also wanted to find out if Branded medicines were better than generic/store branded medicines. We pay a lot more money for the branded names though the ingredients are essentially the same. If both types of medicines are equally effective, then I can save some money for my parents.</p> <p>Methods/Materials 5 tablets each: Claritin Reditabs, Actifed, Benadryl, Zyrtec, Kaiser Permanente Allergy, Walgreens Wal-dryl Allergy, Wal-Zyr, and Allergy Relief (CVS pharmacy), 4 liters HCl/vinegar, measuring cup, 1 timer, 8 plastic cups, and paper towels. Get 8 plastic cups and label all with the 8 different tablet/medicine names. Pour 100 ml of vinegar into each cup. Put the appropriate tablet into each beaker and start the timer. When a tablet/medicine is dissolved, record the time for each. Continue till all the tablets dissolve. Pour out the vinegar/HCl and rinse the cups with water. Dry with a paper towel. Repeat this process for multiple trials.</p> <p>Results By looking at the results (graphs and data), branded medication was more effective overall than the non-branded medication. The only exception was Benadryl. Claritin Reditabs was the most effective medicine of all. All the pairs of medicines had the same ingredients, but the generics were less effective than the branded in all the cases, except for the pair: Benadryl and Wal-dryl.</p> <p>Conclusions/Discussion My first hypothesis was incorrect. Claritin Reditabs was the most effective of all. I thought Zyrtec would be the most effective through my survey. Zyrtec was the fourth fastest medicine. Claritin Reditabs was the most effective. My second hypothesis was correct. Branded medicines was more effective than generic/store branded medicines. The only exception was Benadryl. Finding HCl was very difficult. I also learned a lot of safety while using acids. It was difficult to record the time, write the observations, and also check what was happening in the 8 different medicines simultaneously. After my first trial, I had an idea of how quick</p>	
<p>Summary Statement The allergy medicine that would be the most effective and whether Branded medicines are better than generic/store branded medicines.</p>	
<p>Help Received Used lab equipment at Salinas High School under the supervision of Ms. Merchant; Mother prepared HCl acid solution (pH: 1.4); Dad drove me to pharmacy stores.</p>	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Kaitlyn Spong	Project Number J2131
Project Title The Effects of Acids and Bases on Cooking Potatoes	
Abstract Objectives/Goals This project explains the relationship of the pH of water to the consistency of potatoes cooked in it. In a cooking magazine, it was written that adding a little vinegar to the water before you boil potatoes helps to keep the potatoes from falling apart. The purpose of the project was to further explore this idea. Methods/Materials In the experiments, potatoes were boiled first in regular water, for a control, then in slightly more acidic water, and then in slightly more alkaline water. The idea was that if acidic water -with added vinegar- caused the potatoes to be firmer, then alkaline water - with added baking soda - would cause potatoes to be softer. To get consistent measurements of firmness, a homemade apparatus was used. The apparatus used wire and weights. A wire was placed over a cube of cooked potato. Then weights would be stacked in a bucket hanging off the end of the wire. At a certain point, the weights would cause the wire to slice through the potato. The weight in the bucket was recorded as data. Results My data supported my hypothesis, as the potatoes cooked in more acidic water were indeed firmer than those cooked with regular water or alkaline water. The potatoes cooked in the alkaline water were also of a significantly different consistency, softer than the potatoes cooked in acidic or regular water. Conclusions/Discussion This project has proved that an acidic pH of water will produce firmer boiled potatoes, while an alkaline pH of water will result in softer boiled potatoes.	
Summary Statement My project is about how the acidity or basicity of water affects the cooking of potatoes.	
Help Received Father helped construct apparatus	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Lauren M. Weetman	Project Number J2132
Project Title Stop the Tears!	
Abstract Objectives/Goals The objective of my project was to determine which method of chopping onions caused the least amount of tears and/or discomfort to the test subjects. Methods/Materials My materials were: forty, medium, white onions of the same variety, five sharp, steak knives, five bowls of water with one litre of water in them each, five pairs of Speedo swimming goggles, a freezer, a loaf of Fresh and Easy white bread, seventy-five paper towels, five girls, age twelve, a table, and five plates. I had five girls chop five half-onions each: a control group, one with bread in their mouths, one onion while wearing goggles, one that had been in water for five minutes, and an onion that had frozen for ten minutes; then they logged how uncomfortable they were on a visual pain scale. The duration for chopping for each test was 90 seconds. Results The result was that the watered onion was the least uncomfortable to chop. The onion with the bread in the subject's mouth was the most uncomfortable to chop. Conclusions/Discussion Therefore, the watered onion is the best to use while chopping to minimize discomfort.	
Summary Statement My project was to determine the best method of not crying while chopping onions.	
Help Received My parents helped prepare the onions and supervise the subjects while they were chopping the onions because of the use of knives.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Rebecca L. Wheeler	Project Number J2133
Project Title It's a Hair Affair	
Abstract Objectives/Goals My project was to determine if the following products and minimal grooming would make horses' tails grow faster than the tails of horses not maintained with these products: Cowboy Magic shampoo and conditioner MTG Nutraflax Methods/Materials First I bought the materials. Then every two weeks I would wash the experimental group of horses' tails with Cowboy Magic shampoo and conditioner. Then I put their tails in tailbags. Once a week I put MTG on those tails. The experimental group horses were given Nutraflax daily. The tail growth of the horses in the experimental group were compared to those in the control group every two weeks. Results The horse tails in the experimental group grew at a faster rate than those in the control group. Conclusions/Discussion My hypothesis was correct. The data indicated that the horses' tails in the experimental group grew faster than the tails in the control group. The nutrients in the Nutraflax likely stimulated hair growth and the conditioner, minimal grooming and the use of tailbags prevented breakage.	
Summary Statement My project addresses a successful strategy for increasing the growth rate of a horse's tail.	
Help Received My parents bought the materials, edited my report, helped put my display board together and provided transportation.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Rhajaa R. Wright	Project Number J2134
Project Title Not Your Average Gelatin	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine which additive makes the strongest gelatin. I predicted that citric acid was the additive that would make the strongest gelatin, due to fact it is a natural preservative that prevents decomposition in many goods.</p> <p>Methods/Materials To test this question, I filled popsicle trays with gelatin, and added a different additive to each tray. I used a testing instrument compose of two paper cups, and a popsicle stick, and continuously dropped quarters into the cup section of the campartment of the testing instrument, until the cup rested on the top of the tray, meaning it had cut through the gelatin. Afterwords, I weighed the quarters inside of the cup, to determine how much strength it took to cut through the gelatin with the certain additive.</p> <p>Results Sugar is the additive that created the strongest gelatin. The sugar gelatin had an average average of 118.6 grams needed to cut through it.</p> <p>Conclusions/Discussion The additive that makes the strongest gelatin is sugar. Sugar had an average of 118.6 grams of weight needed to break its gelatin, salt had an average of 63 grams of weight needed to break its gelatin, citric acid had an average of 61.47 grams of weight needed to break its gelatin, the control gelatin had an average of 59.97 grams of weight needed to break its gelatin, and lastly powdered milk had an average of 48.18 grams of weight needed to break its gelatin. The reason I received sugar as the additive that made the strongest gelatin, is because sugar is also a preservative. Food can be stopped from rotting by using natural preservatives. Bacteria doesn't live in places with a lot of sugar, therefore there was no bacteria to secrete their own enzyme to digest the food outside. The results of my experiment are important, because they inform scientists and chefs about the effect diverse additives have on food.</p>	
Summary Statement This project is solemnly focused around discovering the effects different additives have on gelatin, meaning whether the additives make the gelatin stronger or weaker, and the reason they have these diverse effects.	
Help Received No help received while doing the project.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Eric T. Yu	Project Number J2135
Project Title The Effectiveness of a Household UVC Wand in Reducing Bacterial Contamination	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I had heard UVC light could be used to kill bacteria. I also found there were UVC wands commercially available for household use. I designed an experiment to test a UVC wand product. I focused on the time it took the wand to kill bacteria, and the distances above the bacteria at which the wand would be effective. The wand's specifications stated that general cleaning could be achieved if the wand was waved over the targeted area for 20 seconds at a distance of 2.5 cm. I predicted the UVC wand would meet its specification of 20 seconds of treatment at a distance of 2.5 cm. I believed UVC light was an effective method of killing bacteria, and this would be reflected in my results.</p> <p>Methods/Materials I obtained a Germ Guardian UVC Sanitizing Wand. I built three wooden holders that held the UVC wand consistently 2.5 cm, 5.0 cm, or 10.0 cm from the testing sample. I tested for 20, 40, and 60 seconds. An adult helper activated the UVC wand and performed the UVC treatments as I timed the process in an adjacent room. I used Coliscan Easygel and nutrient agar to help identify and culture the results. I inoculated the media directly as a liquid or in a gel state. To obtain bacteria samples from surfaces, I used cotton swabs and inoculated either the Coliscan media or the nutrient agar.</p> <p>Results A total of 63 plates were inoculated with swabs from carpet, shoe, cutting board, pillow, and washcloth surfaces. I also tested creek and aquarium water samples. For all of the test treatments, the UVC wand showed no reliable ability to destroy bacteria. Even at 40 and 60 seconds there were often numerous bacteria after the UVC treatment. No particular distance or time appeared to be consistently effective in reducing the quantity of bacteria.</p> <p>Conclusions/Discussion According to my results, the household UVC wand isn't a reliable or dependable product. The UVC wand couldn't kill 99% of all bacteria on a consistent basis at distances of 2.5, 5.0, or 10.0 cm and at times of 20, 40, and 60 seconds. I do believe using UVC light is an effective way of killing bacteria. The manufacturer's directions were to wave the UVC light wand over the intended target, but with the wand's low intensity, it would perhaps be better to concentrate the light in a stationary position for a set length of time. This would be a very painstaking and tedious way to disinfect any surface and would require an inordinate amount of time and precision.</p>	
Summary Statement I tested a household UVC wand's effectiveness in sanitizing a surface from three different distances (2.5, 5.0, and 10.0 cm) at time intervals of 20, 40, and 60 seconds.	
Help Received Thanks to my science teacher who taught me sterile procedures. Thanks to my mother who used the UVC wand while I timed in an adjacent room. Thanks to my father who purchased wood for the holders i built.	