



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Jason A. Ablott	Project Number J1501
Project Title Acid Rain Accused of Moss Murder	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this environmental science project is to demonstrate that mosses can be used as effective bioindicators. Since mosses act like sponges and draw all nutrients they require from rainwater and the air, the effects of acid rain on the species <i>Grimmia Laevigata</i> will be determined in this science experiment. By evaluating how the mosses react to acid rain it may be determined how polluted the air is near an ecosystem that supports moss growth.</p> <p>Methods/Materials In two separate trials, moss samples were exposed to simulated acid rain solutions ranging from 3pH to 7pH. Samples of <i>Grimmia Laevigata</i> were subjected to daily applications of solutions of varying levels of acidity. Four different samples of <i>Grimmia Laevigata</i> moss were sprayed with acidic solutions, one was sprayed with an acidic solution with a pH of 3.0, one with an acidic solution of 4.0 pH, (which is the level of acid rain), a sample with an acidic solution with a pH of 5.0, and a sample with distilled water, which has a neutral pH of 7.0 (as a control).</p> <p>Results The effects of each acidic solution on each moss sample were monitored to determine whether <i>Grimmia Laevigata</i> could survive highly acidic rain by timing the length of time the samples took to turn a healthy green. After exposure to simulated acid rain for a period of 21 consecutive days the results were compared and examined. These findings demonstrate that after long-term exposure to acidic rain the <i>Grimmia Laevigata</i> samples could not survive. <i>Grimmia Laevigata</i> is sensitive to acid rain and points to its sensitivity to elevated levels of acidity.</p> <p>Conclusions/Discussion This experiment proved that <i>Grimmia Laevigata</i> cannot survive adverse levels of acid rain when exposed to it often. My hypothesis can be accepted If <i>Grimmia Laevigata</i> moss is exposed to an acidic solution containing distilled water and sulfuric acid with a pH level of 5 or less for more than 14 days, then the <i>Grimmia Laevigata</i> moss in the tested sample(s) will enter a dormant state or die. Mosses are an effective, low technology way to monitor the presence of harmful acids in our air and rainwater. When the numbers of mosses in an ecosystem decrease it could be a sign that high levels of acid rain have increased.</p>	
Summary Statement This experiment was performed to determine the effects of acid rain on moss. At which concentration does acid rain become toxic to moss?	
Help Received Dr, Jim Shevock, Dr. Lloyd Stark and Professor Brent Mishler identified the species of moss I used in this experiment. My mom helped with the photographs.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) J. Alejandra Alvarez	Project Number J1502
Project Title Caffeinated Typing	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to find out whether or not caffeine affected typing speed, as well as accuracy.</p> <p>Methods/Materials The experiment involved recording the number of words typed in a two minutes test and the errors made. It was done by testing 10 children (all of them 12 years old and both, female and male). They took a typing test for two minutes. After the test they drank 16 ounces of Diet Coke with caffeine and took another two minutes test. I repeated the experiment with Diet Coke without caffeine.</p> <p>Results The results confirmed my hypothesis that caffeine will make people type faster.</p> <p>Conclusions/Discussion In the experiment the percentage of words typed after drinking soda with caffeine increased by 37.98%, and after drinking soda without caffeine increased by 13.85 %. However, the percentage of errors was higher after drinking caffeine; 16.85%, and without caffeine the percentage decreased by 12.05%.</p>	
Summary Statement I wanted to see if caffeine affected typing speed and accuracy.	
Help Received Teacher who guided me through the project; Mother who helped mount my board; My fellow students for helping me by participating in my experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Ellen M. Azizian	Project Number J1503
Project Title Pain Relievers and Carbohydrates: Analysis of Different Pain Relievers for Dissolving Purposes	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Problem: Does complex carbohydrate/(cornstarch) affect the time it takes for pain relievers with different active ingredients to be absorbed in human body?</p> <p>Methods/Materials Method: The experiment involved mixing water and carbonated water with simulated stomach acid and mixing the same solutions also with carbohydrates. Mixing was done by using magnetic stirrer and measuring pH was done by using a pH Microprocessor Tester. Measured time it took to dissolve acetaminophen, aspirin, ibuprofen, diclofenac sodium, and naproxen base pills in these four solutions.</p> <p>Results Significant Finding: Diclofenac sodium base pills took longest to dissolve and 19-22% longer to dissolve in solutions with carbohydrates. Naproxen base pills took 2nd longest to dissolve and 20%-26% longer in solutions with carbohydrates. Ibuprofen base pills took the 3rd longest to dissolve and 19%-26% longer in solutions with carbohydrates. Acetaminophen and aspirin base pills took the least time to dissolve but 34%-60% longer in solutions with carbohydrates. All pills dissolved quickest in water solution which had the lowest pH (acidic) and took most time in carbonated water solution mixed with cornstarch which had the highest pH (alkaline).</p> <p>Adding carbohydrate such as cornstarch into the drinking solution increased pH (alkaline) and slowed the dissolution rate. Since most pain relievers irritate the stomach, the doctors advise to take them with food.</p> <p>Conclusions/Discussion The data supported my hypothesis that the pain relievers with different active ingredients will take longer to dissolve in water base liquids with simulated stomach acids that contain complex carbohydrates (cornstarch) than in the water base liquids containing only simulated stomach acid.</p>	
Summary Statement The purpose of my project was to determine whether adding carbohydrate to the drinking solution affects the time it takes for the pain relievers to dissolve in the human body.	
Help Received My cousin, the pharmacist, provided me with the prescription pain relievers and supervised me while I was handling them.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Cole J. Berweiler	Project Number J1504
Project Title Ocean Water and Forest Fires	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine whether ocean water would have an effect on California native plants. If the plants died after being watered with ocean water, would they grow back if watered with fresh water.</p> <p>Methods/Materials Materials included: seven sets of two each California native plants, 14 plastic pots, potting soil, ocean water and fresh water.</p> <p>I first planted the fourteen plants and labeled one of each variety "Test" and one "Control." Next, I watered the Test plants with ocean water and the Control plants with fresh water. Then I started observing and monitoring the changes. The next time the plants needed watering, all fourteen plants were watered with fresh water.</p> <p>Results Five of the seven Test plants died, while none of the Control plants died. Of the five Test plants that died only one has re-growth since being watered with fresh water over the last three months.</p> <p>Conclusions/Discussion My conclusion is that ocean water kills several California native plants and most of them do not grow back. Therefore, during a forest fire we should try as hard as possible to use fresh water to put the fire out instead of ocean water.</p>	
Summary Statement My project is to determine if ocean water will have an effect on the growth of California native plants.	
Help Received I participated in general workshops held at my school by my teacher. These workshops provided only general guidance to any student that attended.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Taylor V. Borges; Madeleine T. Kinder	Project Number J1505
Project Title The Effect of Sports Drinks on Blood Pressure and Heart Rate as a Measure of Athletic Performance	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to study the effect of electrolyte sports drinks on seventh grade students by measuring blood pressure and heart rate. It was predicted that the electrolyte drink would help maintain a lower blood pressure and heart rate than water alone.</p> <p>Methods/Materials 30 participants were randomly divided into 3 equal groups: a water group, an electrolyte group and a control group with no liquid. Each participant was administered their drink which was identified by a number so that neither the participant nor the test administrator was aware of which drink contained what liquid. After each participant consumed their drink they were instructed to sit for 10 minutes allowing time for each drink to enter the body and do a set amount of exercise. Testing was staggered in 5-minute intervals to allow time for each participant to have their blood pressure and heart rate measured immediately after exercise. Testing was repeated three consecutive days to establish validity of results.</p> <p>Results Blood Pressure measurement: Subjects who drank water had a 38% increase (systolic) and a 6% increase (diastolic) vs. subjects who drank electrolytes had a 5% increase (systolic) and a 7% decrease (diastolic). Heart Rate measurement: Subjects who drank water had a 73% increase vs. subjects who drank electrolytes had a 43% increase.</p> <p>Conclusions/Discussion The hypothesis was correct, the electrolyte sports drinks did help to maintain a lower blood pressure and heart rate. Though the results proved the hypothesis, the large difference in the blood pressure and heart rate was unexpected. Given that the results revealed such a significant difference in the consumption of electrolyte sports drinks vs. water, we hope to continue with this research to see if the results remain consistent.</p>	
Summary Statement The purpose of this project is to study the effect of electrolyte sports drinks on seventh grade students by measuring blood pressure and heart rate.	
Help Received Leah Stamper helped us continue our research and revise our board. Dave Kinzer, an athletic trainer, helped us think of ways to improve our project. Tedda Borges, helped put together the project and Melissa Kinder, a nurse, helped by taking the blood pressure of the participants.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Sean V. Callero	Project Number J1506
Project Title Glassy Winged Sharpshooter: Wrath of Grapes	
Abstract Objectives/Goals The purpose of this experiment is to find an effective at-home, eco-friendly method for the control of the Glassy- winged Sharpshooter, a vector for Pierce Disease. The grape industry of California is under a serious threat because of disease spread by the glassy winged sharpshooter. Methods/Materials My objective was to study the current larvacides and pesticides used and their effects on the sharpshooter and then to make my own plant extracts from plants found in Ventura County to determine whether these plant extracts could have a lethal effect on the sharpshooter nymphs. I studied and tested 20 plants found in, and around Thousand Oaks and determined that certain extracts were very effective in killing the sharpshooter at its nymph stage before becoming a problem. Results I found that several plant extracts have a lethal effect on the nymph stage of the glassy winged sharpshooter. However, it was very difficult to maintain a culture of sharpshooters in terrariums. They are sensitive and do not thrive in closed conditions. For this reason, my data may not be an accurate reflection of what may happen when the sharpshooter is exposed to the extracts in field tests. Therefore, I am continuing to work on this experiment in the field so that I can obtain additional data needed to prove my hypothesis. Conclusions/Discussion In conclusion, under controlled circumstances, this experiment proved my hypothesis by demonstrating that there are several plants growing in Ventura County having larvacidal capability. My initial findings could aid in the further development of new and improved larvacide strategies to control sharpshooter populations in and around Ventura County thus preventing the spread of disease to the precious grape crops in California without harming the environment. I plan to continue my research even after this project ends working with methodologies of dispersing these new found larvacides.	
Summary Statement The purpose of this project is to develop an effective eco-friendly method for the control of the Glassy-winged Sharpshooter, a vector for Pierce's Disease which threatens California's grape industry.	
Help Received Parents for transportation to farms where sharpshooter is present in Ventura County. Mrs. Maiorca, my science teacher, for her support.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Bryn E. Cloud	Project Number J1507
Project Title Hippodamia convergens: Determining the Toxicity of Pesticides on this Beneficial Bug	
Abstract Objectives/Goals The objective is to determine the toxicity of different categories of pesticides on <i>Hippodamia convergens</i> , commonly known as ladybugs. Ladybugs are beneficial to farmers and gardeners because they consume harmful pests. I believe that that the synthetic pesticides will be the most lethal to ladybugs. Methods/Materials The pesticide categories tested were synthetic, organic, and inorganic. Three pesticides in each category were tested. A control using no pesticide was also examined. Ten trials were performed per variable using ten ladybugs each for a total of 100 ladybugs per test variable. The percentage of toxicity for each trial was recorded. Results For the overall pesticide results the most toxic was synthetic pesticide with an average toxicity of 96%. The least toxic was inorganic pesticides with a 42.3% toxicity rate. Organic pesticides overall toxicity was 93.6%. The average toxicity for the control was 10%. Conclusions/Discussion After completing my investigation on the toxicity level of different categories of pesticides on ladybugs, I found that my overall hypothesis was correct. When compared to other pesticides, I found that the average toxicity rate for the synthetic was 96%, the inorganic pesticides was 42.3%, and the organic pesticide was 93.6%. The synthetic and organic pesticides were about nine times more toxic than the control which had an average toxicity of 10%. This data suggests that organic pesticides are more lethal than people may think. The best pesticides for protecting ladybugs are inorganic pesticides.	
Summary Statement The purpose of my science project is to determine the toxicity of pesticides on <i>Hippodamia convergens</i> .	
Help Received Mother helped type report and supervised experiments	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kathryn E. Cordero	Project Number J1508
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Project Title The Effect of Topical Contaminants on Blood Glucose Levels

<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of the project is to determine how much of a difference a topical contaminant will make on blood glucose levels. A contaminant with higher sugar content will change the blood glucose more than a contaminant with less sugar. The blood used was obtained solely from the experimenter. In this project to test for the blood glucose you have to prick your finger to get a blood sample. Then the blood glucose meter reads the blood glucose and displays the blood glucose in mg/dl. The hypothesis was correct the blood glucose was changed the most by the contaminant group with milk it was changed by 234%. Milk had the most sugar and milk made the most difference. The hand washing made the least difference it changed by 5%.</p> <p>Methods/Materials The blood used was obtained solely from the experimenter. nothing on the finger; Use lancet devise with lancet inside to poke finger for blood; Put blood on strip that is connected to the freestyle blood meter ; Record reading; an alcohol swab; Wipe finger once; Use lancet devise with lancet inside to poke finger; Put blood on strip that is connected to the blood meter; Record reading; hand sanitizer ; Put 1 drop on the finger; Then let it dry for 50 seconds; Use lancet device with lancet inside to poke finger; Record reading; hand washing; Wet hands with warm water ; Rub the soap on the finger rinse well; Dry hands with a paper towel; Put blood on strip that is connected to the blood meter; Record reading; milk; Dip finger in milk for 3 seconds; Let it dry for 60 seconds; Use lancet device with lancet inside to poke finger; Put blood on strip that is connected to the blood meter; Record reading.</p> <p>Results My hypthises was correct the Topical contaminant with the most sugar made the most difference in blood glucose levels and the contaminant with the least amount of sugar made the least difference.</p> <p>Conclusions/Discussion It is important to get an accurate reading. When the score is not it can be dangerous. The substance that changed it the most was milk the least was purell it changed by 100 mg/dl. The contaminant that changed readings the least was Purell. Hand washing did not seem to change readings much. The group that had no preparation or cleaning was different every time, because there was no way of knowing what was on the finger prior to testing. It seems the reason the milk had the most impact on blood glucose scores is because it has the most sugar content.</p>
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Summary Statement This Project is testing the accuracy of blood glucose readings and showing the importance of properly cleaning your finger before testing blood glucose levels
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Help Received



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Aaron F. Crasnick	Project Number J1509
Project Title Will Higher Concentrations of Aloe vera Quicken the Regeneration of Planaria?	
Abstract Objectives/Goals I tested to see whether higher concentrations of Aloe vera would speed up the regeneration of planaria. My hypothesis was that although Aloe vera would quicken the regeneration, higher concentrations of Aloe vera would not make any difference in regeneration time. Methods/Materials Aloe vera solutions of 0%, 10%, 20% and 30% were added to Petri dishes, 3 dishes for each concentration. The planaria, 3 for each dish, were cut under magnification, exactly in the middle. Six worm fragments (3 heads and 3 tails) were added to each Petri dish containing the varying solutions of Aloe vera. The planaria were observed daily for signs of regeneration (the rounding of the cut end and directional movement in the tail end). The length of each fragment was measured with each water change, every 3 days. Results The control group, or that in the 0% Aloe vera solution, took nearly two weeks to regenerate, while the planaria in the 10% solution took 8 days to do so. The planaria in the 20% Aloe vera solution did not regenerate faster than those in the 10% solution, and over one-half of the 20% solution planaria died. All planaria in the 30% Aloe vera solution died. Conclusions/Discussion In conclusion, my data revealed that Aloe vera, in small amounts, has a positive effect on the regeneration of planaria, speeding up regeneration time by about 3 days. More importantly, there was no significant difference in regeneration time between planaria in the lower and higher concentrations of Aloe vera. The higher concentration of Aloe vera appeared to be toxic to the planaria.	
Summary Statement My project investigated whether higher concentrations of Aloe vera would speed up the regeneration of planaria.	
Help Received My parents helped me buy the materials for the project, and my mother helped me brainstorm ideas when all the planaria started dying.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Keith E. Doerschlag	Project Number J1510
Project Title Investigation of Delayed Onset of Motion Sickness using Ginger Brew	
Abstract Objectives/Goals My investigation was designed to test the popular idea that ginger, mostly used as a cooking and flavoring ingredient, could reduce or prevent motion sickness. Based on literature research, it was hypothesized the reported 26 grams of fresh ginger used to make one serving of a favorite all-natural soft drink product would significantly delay the onset of motion-induced nausea in people. Methods/Materials After filling out a survey to verify susceptibility and experiences with motion sickness, volunteer human subjects were blindfolded and seated in a spinning chair apparatus that was then rotated at approximately 24 RPM. Spin trials were done on non-consecutive days without ingesting the test drink, and after paced consumption of one 12-oz bottle of Reed's Extra Ginger Brew. During the spin trials, people were asked every 15 seconds to subjectively rate stomach discomfort in an ascending number sequence of any range they desired. Spinning was stopped by subject's request just before actual illness (vomiting). Numerical responses were normalized to a common 0 to 100 range and these "sensation index" values plotted versus time to gauge whether delayed onset occurred. Results Most tested persons showed about the same or slightly improved resistance to nausea after drinking the ginger brew. One subject, however, almost doubled the chair time before asking to stop. People who rated themselves as less prone to motion sickness had the longest durations in the chair with or without ginger brew, but their resistance to nausea onset actually worsened with the drink. Many individuals reported queasiness went away much faster in the ginger brew trial. Conclusions/Discussion My conclusion is that ginger brew may be mildly to highly effective in delaying motion sickness for some people. A second notable and unexpected beneficial effect seemed to be more-rapid recovery from nauseous feelings once motion was stopped. Unfortunately, ginger brew does not appear to work for all persons. Pharmacology of the test ginger brew might be affected by the drink's preparation (is it heated?), and further studies with fresh or dried ginger root, or the more palatable pickled ginger that accompanies sushi, could help resolve uncertainties in ginger's effectiveness.	
Summary Statement Trial data with human subjects suggests consumption of delicious Jamaican-style ginger beer can delay and reduce the nauseous feelings of motion sickness for many people.	
Help Received Dad provided spin power for the chair. He also helped with the idea of a single 0 to 100 data range for responses, and taught me how to do literature search in UC Riverside library.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Kinsey C. Drake	Project Number J1511
Project Title Do Vegetarians Get Enough Essential Nutrients?	
Abstract Objectives/Goals The objective is to find out if vegetarians get enough essential nutrients Methods/Materials Nine people (3 non vegetarians, 3 flexatarians ¹ , 3 vegetarians) were asked to write down what they ate for three days to determine what foods they ate. Once I had that information, I used the USDA My Pyramid Tracker to calculate what nutrients they ate for those three days. The required amounts were used as a sort of control to determine what the subjects should eat. The amount of nutrients they should eat was determined by age, gender, height, and weight. (1) A flexatarian is someone who eats fish and minimal amounts of meat Results In all groups of subjects, there was an adequate if not more than needed, supply of vitamin B12, vitamin B6, Protein, carbohydrates, vitamin C, and iron. All groups needed more potassium and fiber. All groups except for non-vegetarians needed more calcium. Vegetarians tended to get less than needed of zinc and vitamin A Conclusions/Discussion My hypothesis turned out to be partially incorrect. According to my results, being a vegetarian does not necessarily mean you do not get enough nutrients. There were a few nutrients vegetarians didn't get enough of, but that can easily be accomplished by eating more fruits, vegetables, and dairy. Vegetarians do get less protein than other people, but that doesn't mean they don't get enough. If you are a vegetarian, you simply get less protein than non-vegetarians.	
Summary Statement This research was intended to discover and conclude if vegetarians get enough essential nutrients on a daily basis.	
Help Received My dad taught me how to format graphs (although I did them myself), and my teacher gave me advice on the research I should do.	



**CALIFORNIA STATE SCIENCE FAIR
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Name(s) Anastassia P. Erudaitius	Project Number J1512
Project Title Daphia on Drugs	
Abstract Objectives/Goals The object is to learn and determine how various substances, such as; epinephrine, caffeine, aspirin, and ibuprofen affect the heart rate of the crustacean-like animals, daphnia. Methods/Materials About 80-85 daphnia total were selected for testing and all of the daphnia were kept in the same controls and conditions. About 5 daphnia were tested per drug without being exposed to any of the substances, then one daphnia was exposed to a substance and the heart rate was counted three times to increase the accuracy of the outcome. Another daphnia was selected and the process was repeated, about 20 daphnia were tested per substance and no daphnia was used more than once. Results The averaged unaffected heart rate was 300 beats per minute. The only substance that increased the heart rate of the daphnia was caffeine, which increased the unexposed heart rate by about 41-44 beats per minute. The substance with the greatest change was aspirin, which decreased the daphnias# heart rates by 73-75 beats per minute averaged. Epinephrine decreased the heart rates by 7-9 beats per minute averaged, and Ibuprofen-Elixsure decreased the heart rates by about 65-70 beats per minute averaged. Conclusions/Discussion While the objective was attained the hypothesis was only slightly supported. Only caffeine increased the heart rates and Ibuprofen and aspirin decreased the heart rates much more than predicted. With this knowledge it is possible to understand the ways certain substances affect the heart.	
Summary Statement To test how four different substances will affect the heart rate of daphnia.	
Help Received Mother took my pictures and stopped and started stopwatch.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Alyson S. Favilla	Project Number J1513
Project Title The Daphnia Dilemma	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The intent of this trial of toxicity determination was to ascertain whether a plankton called Daphnia (magna) could be used as a reliable bioassay to measure the health of aquatic ecosystems. It was hypothesized that the levels of Pyrethroid-based pesticides in the water would affect the daphnia, and the results would likely reflect the said levels of pollutants.</p> <p>Methods/Materials To begin with, two different pesticides with various levels of dilution were exposed to three daphnia magna per Petri dish, while the reproduction rate and the mortality rates of the daphnia were recorded over a period of 48 hours. Afterwards, the daphnia were removed to a purified water environment, to watch for further effects of the Pyrethroids.</p> <p>Results Results: As the levels of mortality and reproduction dropped or rose accordingly to levels of concentration of amount of dilution of pesticide in the water, it would be apparent that the hypothesis was correct. The higher the concentration and amount, the steeper the mortality rate, the stronger the concentration, the greater the drop in reproduction by the daphnia, which gave accurate representations of amounts and concentrations.</p> <p>Conclusions/Discussion From my findings, Daphnia can be used as a bioassay, to determine the health of our water, our oceans, and their ecosystems. It would be recommended to remove Pyrethroid and similarly based pesticides off the market, so that they cannot become run-off and pollute our coastal environment, as they have become known to show very toxic results in small aquatic invertebrates, which can steadily move up the food chain, until it reaches those who poisoned the oceans in the first place.</p>	
Summary Statement To use a plankton called Daphnia magna to see if they can be used as a reliable species indicator by reacting specifically to Pyrethroids.	
Help Received Dr. Steven Lipkin of UCI helped determine correct dilutions and use the micro-pipets correctly, Mrs. Rines (science teacher) helped edit Review of the Literature, Mr. Steven Bay of SCCWRP gave time for an interview.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Irfan S. Habib	Project Number J1514
Project Title Toxic Impact of Household Chemicals on the Environment	
Abstract Objectives/Goals The purpose of this project was to determine how different concentrations of household chemicals (bleach, ammonia, rubbing alcohol) affect the growth of plant seeds. I think that ammonia will have the greatest impact because it gave off the worst toxic odor when the bottle was opened!	
Methods/Materials 9 dilutions of household bleach, ammonia, alcohol were made (eg. 1%, 3.2%, 10% of each). 20 seeds each of radish, lettuce, spinach seeds were planted into 90 dishes (30 dishes of each seed). 15ml of the dilutions were added to 81 dishes and labeled by seed/chemical/% (eg. radish/bleach/1%). 27 dishes radish, 27 dishes lettuce, 27 dish spinach. 9 dishes were kept as controls (3 lettuce, 3 radish, 3 spinach). 15ml distilled water was added to each control. Emergence and shoot height were observed and recorded after day 5 and day 14.	
Results In the first few days the seeds exposed to the 1% solutions seemed to emerge sooner than the controls. This may be due to the chemical's loosening of the seed coat, allowing the shoot to break through more rapidly. Despite these effects, the controls presented the greatest number of seeds emerged in 5 days and in 14 days, and the highest average shoot height in 14 days. All results were recorded in data tables and graphed. From the graphs, it appears that the 10% concentration of all three chemicals had the greatest relative impact of emergence and seedling height for radish, lettuce, and spinach.	
Conclusions/Discussion My hypothesis was wrong. Bleach was the most toxic chemical that had the greatest impact across all three concentrations tested. Ammonia and alcohol were similar in toxicity; however, the data tables and graphs indicate that ammonia was more toxic. Out of the three seeds tested, spinach appeared to be the most sensitive. As the concentration of the contaminant solution increased, the percentage of emergence and average shoot height decreased.	
Summary Statement Impact of household chemicals (bleach, ammonia, rubbing alcohol) on the emergence and average shoot height of radish, lettuce and spinach.	
Help Received qualified scientist, Dr. N. Khandakar, handled hazardous substances; Mother helped with project	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jaclyn M. Hirbawi	Project Number J1515
Project Title Effects of Aerosol Sprays on Drosophila melanogaster Reproduction and Mortality	
Abstract Objectives/Goals I have sometimes wondered whether commonly used household sprays might affect our health. Recently, I have seen many ads for room air fresheners. I decided to design an experiment to test the toxicity of these substances on fruit flies, which are commonly used as model organisms for such studies. I hypothesized that some of the seven common household products I chose to test might have an adverse affect on fruit fly reproduction and mortality rates. Methods/Materials I experimented with 480 fruit flies and seven commonly used aerosol sprays: Oust, Febreze, Air Wick, Neutra Air, Lysol, and Glade; I also included a cleaning agent, Pine Sol. I cultured fruit flies in 24 vials. For each of the seven substances, I made two different concentrations of the products which I then mixed into the media to produce 13 ppt and 25 ppt. I kept four control vials; no chemicals were added to these. All of the 24 vials began with the same number of fruit flies in each of my two experiments. For each experiment, for a period of 30 days, I monitored daily the number of eggs, larvae, pupae, dead adults, and live adults in each vial. I also looked for changes in fruit fly behavior and for mutations. I based my findings on this data. Results My data showed that all of the household products had some impact on the health of the fruit flies. Exposure to Glade was most adverse; followed by Lysol, Neutra Air, and Air Wick. Oust, Pine Sol, and Febreze effects were the least adverse. The severity of the effect increased in proportion to the concentration in the media. Glade and Lysol produced mutated flies at both the 13 ppt and 25 ppt concentrations. No other products produced mutations. Conclusions/Discussion The chemicals in the aerosol sprays appeared to have an adverse affect on the health of the fruit flies. Glade and Lysol not only dramatically affected fruit fly reproduction and mortality, but also produced mutations. These findings should be confirmed by growing more cultures and repeating the experiment at various concentrations. Although the household substances I tested are considered safe, and the doses in the media were high, my results suggest that perhaps long-term repeated exposure may have an effect on health. This should to be investigated further.	
Summary Statement The purpose of this project was to investigate the health effects of commonly used air fresheners on mortality and reproduction in Drosophila melanogaster.	
Help Received Thanks to my parents who provided some of the money I need to purchase the fruit flies. Thanks to my science teacher who lent me a video microscope so I could better view the flies during my second experiment. Thanks to Timberline Inc., the fruit fly distributors who answered many of my questions.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Codi L. Hirsch	Project Number J1516
Project Title Magnified Magna: The Flea Beat!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to see the effects of caffeine, nicotine, and alcohol on the heart rate of a <i>Daphnia magna</i>, a water flea.</p> <p>Methods/Materials The method of this experiment was I first made three different concentration solutions for the caffeine, nicotine, and alcohol. In total, I had 9 different concentrations. I used Stay Awake caffeine tablets, 80-proof whiskey, and an all-natural cigar. Then I exposed <i>Daphnia magna</i> to the least amount concentration (.25% of original) after I took a control average heart rate. Then I exposed them to the .5% and finally the 1%. I did this with three fleas for each substance. I used a total of 9 fleas. After I took averages of all the heart rates, I looked for change.</p> <p>Results I found that flea #1 with alcohol had an average decreased heart rate of 61.9 beats per minute. Flea #2 with alcohol had an average decreased heart rate of 72 beats per minute. Flea #3 with alcohol had an average decreased heart rate of 1.9 beats per minute. Flea #4 with caffeine had an average increased heart rate of 28 beats per minute. Flea #5 with caffeine had an average increased heart rate of 52 beats per minute. Flea #6 with caffeine had an average increased heart rate of 48 beats per minute. Flea #7 with nicotine had an average increased heart rate of 42 beats per minute. Flea #8 with nicotine had an average increased heart rate of 28 beats per minute. Flea #9 with nicotine had an average increased heart rate of 5 beats per minute.</p> <p>Conclusions/Discussion In conclusion, I found that my hypothesis was mostly correct. Caffeine increased the heart rate at an average of 42 beats per minute. This is about a 14% increase. Alcohol decreased the heart rate at an average of 44 beats per minute, which is about a 17% decrease. Nicotine increased the heart rate at an average of 27 beats per minute, which is about a 8% increase. But I also noticed that with the alcohol, the heart rate actually started to increase when going from the control heart rate to the .25% and .5%. But when the fleas were exposed to the 1% concentration, their heart rates decreased dramatically.</p>	
Summary Statement My project explored the effects of caffeine, nicotine, and alcohol on the heart rate of a <i>Daphnia magna</i> .	
Help Received Father helped record time while I counted heart rate under the microscope and mother took pictures.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Eugene Laksana	Project Number J1517
Project Title Calcium vs. Protein	
Abstract Objectives/Goals The purpose of this experiment is to determine which mineral works more efficiently in strengthening bones: calcium or protein. I also used drinking soda and vinegar to see whether phosphoric acid or acetic acid would damage bones more. Methods/Materials MATERIALS: Plastic cups, rubber bands, plastic food wrap, chicken bones, labels, gold scale, boiling pan, Texture Analyzer Stable Micro Systems, TEE 32 software, measuring cup, calcium, protein, water, drinking soda, vinegar, trimmer, knife. METHODS: Place one bone in each 45 cups. Separate them in 9 sets with 5 cups in each set. Fill each set as follows: Set1 - Water; Set2 - Vinegar; Set3 - Drinking Soda; Set4 - Vinegar & Calcium; Set5 - Drinking Soda & Calcium; Set6 - Vinegar, Calcium, Protein; Set7 - Drinking Soda, Calcium, Protein; Set8 - Vinegar & Protein; Set9 - Drinking Soda & Protein. Examine the bones daily and take them out on day eighteen. Allow the bones to dry for two days. Record the bones' weights using the gold scale and test their strengths using the Texture Analyzer Stable Micro Systems. Results Set5 was the strongest, Set3 came in second, Set1 came in third, Set9 came in fourth, Set6 came in fifth, Set4 came in sixth, Set7 came in seventh, Set8 came in eighth, and Set2 was the weakest. Conclusions/Discussion Set5 (Drinking Soda & Calcium) turned out to be the strongest. Set2 (Vinegar) was the weakest. According to my experiment, I concluded that calcium is more beneficial for bones than protein. I also found out that phosphoric acid does not do as much weakening to the bones as acetic acid which is known to promote skeletal elasticity.	
Summary Statement This project is to determine whether calcium or protein is better in strengthening bones.	
Help Received Mother helped design board, journal, report. Father helped with photography. Dr. Omary supervised me in using Cal Poly University's lab equipment, Texture Analyzer Stable Micro Systems. Mrs. Krista Taylor, my science teacher, assisted in completing my research.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Karley J.K. Lassley	Project Number J1518
Project Title Which Natural Substance Will Work as a Pesticide on Mosquito Larvae?	
Abstract Objectives/Goals The purpose of my science project is to determine if natural substances will kill mosquito larvae. The reason I am doing this investigation is to determine if it is really necessary to use pesticides made with harmful chemicals. Nobody enjoys being bit by mosquitos, but is it really safe for our environment to use so many chemicals? Methods/Materials For my control test I will place 15 mosquito larvae in a container filled with water. For my next test group I will place 15 mosquito larvae in a container with a mixture of 5% test substance to 95% water. For my last test group I will place 15 mosquito larvae in a container with a mixture of 15% test substance and 85% water. I will reapeat these steps with each of my test substances; citric acid, apple cider vinegar, and cinnamon. Each test will consist of 10 trials. I will observe and record how long it takes for the mosquito larvae to die. Results The solution of 15% cinnamon to 85% water was the most effective for killing mosquito larvae, taking only 6 hrs. 5% cinnamon to 95% water was still effective, taking 24 hrs to kill all the larvae. The solution of 15% citric acid to 85% water took 42 hrs. to kill all the larvae. The 5% citric acid to 95% water solution was ineffective. The 15% vinegar to 85% water solution took 18 hrs to kill all the larvae. the 5% vinegar to 95% water solution was ineffective. Conclusions/Discussion After completing my science project I found that my hypotheses were partially correct. My hypotheses stated that citric acid, apple cider vinegar , and cinnamon would be an effective way to kill mosquito larvae. While all the substances did eventually kill the mosquito larvae, the cinnamon solutions were the most effective in the shortest amount of time.	
Summary Statement This project is to determine if it is possible to control the mosquito population by killing the larvae with natural substances.	
Help Received Rory D. McCabe, M.S. provided mosquito larvae and mosquito information. Dr. Fred LoGalbo provided cinnamon information. Carl Gong helped with experimental flow chart. My mom helped to type my written work and photograph the experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Cristina Machado	Project Number J1519
Project Title How Does Caffeine Affect the Rate of Your Pulse?	
Objectives/Goals This experiment was conducted to find the effect of caffeine on the rate of pulse of humans. The pulse rate of five persons of different age levels were measured before and after the consumption of two beverages that contain caffeine. The results showed that pulse rates tend to increase about 20 minutes after consumption of both beverages. The experiment also showed that there is no considerable difference in increase in the rate of pulse in response to the two sources of caffeine.	
Abstract The results showed that pulse rates tend to increase about 20 minutes after consumption of both beverages. The experiment also showed that there is no considerable difference in increase in the rate of pulse in response to the two sources of caffeine.	
Methods/Materials 50 persons 50 16oz cups of coffee 50 16oz cups of Coca- Cola	
Results I monitored the subjects pulse rate before and after drinking the caffeine. I discovered how their pulse rate increased, especially on the smaller children. Beside the pulse rate increase I noticed other symptoms. Some of them were loss of sleep, and an energy boost.	
Conclusions/Discussion The results support my hypothesis. All fifty persons pulse rate were increasing after they drank the beverages that contained caffeine.	
Summary Statement My project is about figuring out how caffeine affects the rate of your pulse.	
Help Received Mother helped type information	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jorie A. Moore	Project Number J1520
Project Title Testing the Toxicity Level of Different Residues Produced by Various Aquatic Environments	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Objective: The objective of my project is to determine the toxicity level of different residues produced by various aquatic environments. My hypotheses were the residue from the heat pesticide environment would be the most harmful to the African Dwarf frog eggs# hatch rate, the residue from the aeration fertilizer would be the least harmful to the frog eggs# hatch rate, and each different environment will decrease the toxicity level of the toxins.</p> <p>Methods/Materials Materials and Methods: I used oil, Malathion, Ammonia Sulfate, and materials to create four different environments, heat, wave, cold, and aeration, 640 African Dwarf frog eggs. I put the toxins through the four environments for two days then I took the residue from the environments and placed 1 ml in to the twenty ml. container with the eggs. I had one control which had the eggs in their natural environment and three direct controls where I put the toxins directly into the frog eggs# environment for five days along with the other tests.</p> <p>Results Results: The residue from the cold and wave environments were consistently the most harmful to the frog egg hatch rate with a seventy percent or lower hatch rate compared to the control which had a hundred percent hatch rate after five days. The residue from the heat environment was consistently the least harmful to the frog egg hatch rate after five days. All the environments decreased the toxicity of the three different toxins.</p> <p>Conclusions/Discussion Conclusions: I concluded that the different environments had a positive effect on the toxicity of the pollutions when compared to the direct pollution but the residue still harmed the frog eggs# hatch rate when compared to the natural hatch rate of the eggs.</p>	
Summary Statement the purpose of my project is to determine the toxicity level of different residues produced by various marine environments	
Help Received Frog eggs provided by Mr. Stewart Wiley. Mother helped revise project and helped put the board together. Dad supervised the experiment involving toxic chemicals.	



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Neeka Nasrolahi; Faith Stenner; Laura Van Druten	Project Number J1521
Project Title Under the Influence	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to determine how a caffeine solution, an adrenalin solution, and a caffeine-adrenalin solution affect the heartbeat of daphnia pulex organisms. The hypothesis was the caffeine-adrenalin solution would increase the heart rate of a daphnia pulex the most, followed by the adrenalin solution, then the caffeine solution, which will increase the heart rate the least.</p> <p>Methods/Materials The materials used include a daphnia pulex culture, one large and small pipette, a microscope, pure adrenalin and caffeine powder, 3,000 mL of distilled water, three 1,000 mL graduated cylinders, 4 double-depression slides, and 2 single gallon plastic containers full of water. First the caffeine solution was created and we transferred a daphnia onto a slide using a pipette. The number of times its heart beat in a minute was counted under the microscope. The data and observations were recorded. The caffeine solution was added to the slide. The number of times its heart beat in a minute was counted again under the microscope after it was allowed to absorb the caffeine. The data was recorded. The steps were repeated ten times using separate daphnia. The remaining adrenalin and caffeine-adrenalin solutions were created. The same methods were used to see how they affected the daphnia. A separate daphnia was used each time and the data was recorded.</p> <p>Results After testing the daphnia we found that the caffeine solution affected the heart rate the most with an average increase of 95 beats per minute. Next at an average increase of 81 beats per minute was the adrenalin solution. Lastly, the caffeine-adrenalin solution had an average increase of 62 beats per minute. The caffeine solution had the most affect on the heart rate of the daphnia pulex. In our experiments the behavior of the daphnia after they were exposed to the solution were observed.</p> <p>Conclusions/Discussion The hypothesis was rejected by the data. The hypothesis was that the mixed solution would affect the heart rate the most, followed by adrenalin, and then caffeine. The actual results were the opposite of our hypothesis. The caffeine affected it most, then adrenalin and lastly the mixed solution. The caffeine solution in proportion to the daphnia could have been an overdose. The adrenalin did not affect the daphnia as much as the caffeine. The caffeine-adrenalin solution could have had little effect because both strong solutions possibly canceled each other out.</p>	
Summary Statement This project was about the effects of a caffeine, adrenalin, and a caffeine-adrenalin solution on daphnia pulex organisms.	
Help Received completed the experimentations at Raney Intermediate under the supervision of Ms. Fisher who also provided some of our needed materials for us, parents provided transportation	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Suchita Nety	Project Number J1522
Project Title Impact of Nanoparticles on Human Analogs	
Abstract Objectives/Goals For my project, I studied the mechanical and toxic effects of commonly occurring nano particles on ciliated organisms and bacteria-used as human analogs. I predicted that the nano particles would be able to slow the movement of the cilia, meaning that it would be able to enter the human body. I also thought that there would be signs of inhibition on the plates of bacteria when exposed to the nano particles, indicating a harmful chemical effect. Methods/Materials I chose to use the smallest possible sizes of these materials to understand the impact of the effects of nano-sizes. Experiments were carried out with Titanium Dioxide, Carbon, and Chromium on Spirostomum ambiguum, Blepharisma americanum, and E. coli. Results It was found that dilutions of even 30% can cause significant reduction in the motion of these ciliated organisms. The bacterium did not show any adverse toxicity effects of the nanoparticles # a good thing because the materials that I tested are all around us. Conclusions/Discussion In conclusion, part of my hypothesis was correct; the nano particles slowed the movement of the ciliated protists. The other part was not supported by my data; the E. coli plates showed no signs of inhibition of growth. For the future, it will be interesting to extend these studies to deep nano sizes and other human analogs.	
Summary Statement The goal of my project was to use human analogs, ciliated protists and bacteria, to understand if common nano particles could be harmful to human health.	
Help Received Used lab equipment at Schmahl Science Workshop under supervision of Mrs. Sarah Thaler	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Victoria Nguyen	Project Number J1523
Project Title Static Charge Distribution: A Plant Growth Revolution	
Abstract Objectives/Goals The objective of my project was to determine the effects of different electrostatic field directions on the growth of radishes. Methods/Materials Twelve apparatuses were created using glass beakers, plastic wrap, paper towels, aluminum mesh cylinders, congruent octagon meshes, perpendicular bamboo skewers, 9-volt batteries, and alligator clips. Four radish seeds were inserted into each beaker on equidistant points and received a constant water supply of 20 ml. The different electrostatic field directions were established using alligator clips and 9-volt batteries. Four beakers were in a control, four had a radial (perpendicular) electrostatic field, and four had an axial (parallel) electrostatic field. The stem and root growth was measured daily over the course of seven days. The experiment was repeated twice and there was a total of 1344 numbers obtained from 96 radishes. Results Radishes grown in a radial electrostatic field had a 21.9% increase in stem growth and a 13% increase in root growth compared to the control. Radishes in an axial electrostatic field had a 37.5% increase in stem growth and a 43% increase in root growth compared to the control. In addition, they had a 12.8% increase in stem growth and a 26.5% increase in root growth compared to the radial group. Conclusions/Discussion The effects of different electrostatic field directions are reflected in the greater percentage of stem and root growth in radishes grown in an axial electrostatic field. The information obtained in this investigation is important as scientists continue to investigate the field of electro-culture and hydroponics. The results of my project could be used by harvesters to grow crops with less effort, time, and expense without the use of chemical or genetic modifications. It could also be used in areas with infertile soil or with limited land.	
Summary Statement I purpose of this experiment is to investigate how radial and axial electrostatic fields affect the growth of radishes.	
Help Received Mrs. Marcarelli gave helpful lectures and was a science fair advisor; Parents helped financially; Mr. Negus and Mr. Blank provided the initial idea for this project and assisted with procedure.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Alexis Olmo; Sasha Polovneff	Project Number J1524
Project Title How Does the Level of Salinity with which a Plant Is Watered, Affect Its Growth?	
Objectives/Goals Our goal was to see if 50 day artichoke plants would grow with different amounts of salinity in our irrigation.	
Abstract	
Methods/Materials In our project, we started off with making our different percents of salt in water. Next, we watered the plants over a three week period. After, the two of us measured and recorded our data. Materials: 2 planting trays; 10.5 milliliters of easy dissolving sea salt (refill when needed); 390.5 milliliters of fresh water/tap water (refill when needed); 135 artichoke plants, 50 day old, irrigated with fresh water; 5 spray bottles; Potting soil; 100mL cylinder; 1 Ruler; 1 Jewelers scale.	
Results After measuring our plants and analyzing our data, we found out that as we increased the salinity in our irrigation system, the plants decreased in size and length. Also, the two of us found the saltier the water, the heavier the plant. Goals: In our project, the goal was to see how salt water would affect a plants.	
Conclusions/Discussion After conducting our experiment over the three-week period, we found out (from our four graphs) that the healthiest artichoke plants were in the groups watered with the zero and one percent salinity liquids. Our results were different from our original hypothesis, because we thought that the group we used fresh water on would produce the healthiest, strongest, heaviest, and longest plants. Also, we thought that artichoke plants in groups watered with 2%, 3%, and 3.5% liquids would grow weaker and lighter than the ones watered with fresh water. Surprisingly those groups died within two weeks, and the plants weighing the least were in the fresh water group (according to graph one)! Now we know that plants grown with salty water, can grow heavier. Adding a little salt into the water makes it have an electrical current that makes the plant receive nutrition easier. But too much salt can kill the plant!	
Summary Statement In our project we grew 50 day old artichoke plants over a three week period, with different concentrations of salt water.	
Help Received Sasha's dad helped with the artichoke plants and Alexis' dad helped with the picture frames	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Elexis S. Padron	Project Number J1525
Project Title Comparing the Toxicity Levels of Various Types of Vitamins on Planarian	
Abstract Objectives/Goals The purpose of my project is to compare the toxicity levels of various types of vitamins on planarian. This science project investigates how toxic different vitamins are to other organisms Methods/Materials Bisected planarian were placed in two different amounts of vitamin solutions. I compared a set of groups with a mixture of: twenty-five milliliters of pond water and one milliliter of vitamin; to a set of groups with twenty-five milliliters of pond water and four drops of vitamin; and one control group with just twenty-five milliliters of pond water. The planarian were bisected between the anterior (head) and the posterior (tail). Then I placed them in a mixture of pond water and vitamin solution in a Petri dish and compared them with planarian in a control group filled with pond water only. I used four different vitamins: vitamin A, vitamin B12, vitamin D, and vitamin E. I used a control group so I can compare how fast they would die in their regular environment as opposed to the environment with vitamins. I observed the planarian daily, recording how many died each day until they were all dead. Results The results of my investigation of the toxicity levels of different vitamin solutions on planarian clearly indicates that vitamin E is the most toxic to planarian Conclusions/Discussion Vitamin D is the least toxic to planarian and vitamin E is the most toxic. The vitamins we take to keep us healthy are toxic to planarian. The concentration of the vitamins was too high for the planarian.	
Summary Statement My project evaluates the effects of four different vitamins on planarian.	
Help Received Mother helped cut/glue paper to board on evenly, father supervised experimentation and supported me the whole way.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) McKay C. Palmer	Project Number J1526
Project Title Salty Germination	
Abstract Objectives/Goals The objective is to find out if salt water would be beneficial and or toxic in the germination of lettuce seeds. Methods/Materials Seven different concentrations of NaCl were prepared. A control solution of DI water was also used. Four petri dishes were used for each concentration. Brown paper towels were moistened with each of the liquids and added to the petri dish, five seeds were then placed in each one of them. The petri dishes were then covered in a towel and placed in a cool dark area and allowed to germinate for five days. After this period of time the roots of each of the seeds were then measured to determine their growth. Results As the concentration of NaCl increased the amount of root growth decreased. For the NaCl concentration of 0.4M there was no germination. The NaCl concentration of 0.010M actually showed the most amount of growth, this was even greater than the control solution of pure DI water. Conclusions/Discussion The results show that a little bit of NaCl (sodium chloride) is beneficial in the germination (growth) of lettuce seeds. It also showed that at high concentrations of salt water (0.4M), this can be toxic to the lettuce seeds, none of the seeds sprouted. The 0.010M solution of NaCl was the best solution for the germination of the lettuce seeds. Salt buildup is an existing or potential hazard on almost all of the 42 million acres of irrigated farmland in the United States. A small amount of salt in the soil will not affect the germination and growth of crops. However, as salt concentrations go up, negative impacts occur. Eventually salt concentrations will affect the germination of seeds. Excessive salt concentrations are presently costing the U.S. billions of dollars in lost food crop.	
Summary Statement The affects of salt water on the germination of lettuce seeds.	
Help Received Mother helped put the science board together. Dad helped type report. Used chemicals and balance from Clinical Laboratory in Grand Terrace.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Madeleine J.B. Pardini	Project Number J1527
Project Title The Effect of Parasitic Worming Medication in Horse Manure on Red Worms in a Compost Setting	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine if horse manure containing parasitic worming medication would kill red worms in a compost setting.</p> <p>Methods/Materials Three samples of horse manure were collected from Frazier, a 20 yr. old Quarterhorse gelding. The first sample was collected approximately 8 to 10 weeks after his last dose of worming medication, the second sample was collected 24 hrs after administration of Athelcide EQ Paste (oxibendazole) and the third sample was collected 72 hrs after administration. Three compost settings were made, one containing the pre-worming manure, the second with the 24 hr post worming manure and the third with a mixture of the post 24 hr and post 72 hr manure. To each of these was added 100 red worms (<i>Eisenia fetida</i>), a small amount of dirt and shredded newspaper. The worms were observed over a two-week period and were counted at the end of the observation period.</p> <p>Results The pre-worming compost setting contained 90 live worms, whereas the 24 hr post-worming sample contained only 4 live worms and the 24 hr/72hr post-worming sample contained 5 live worms.</p> <p>Conclusions/Discussion My conclusion is that worming medication found in horse manure does kill red worms in a compost setting. This result should be considered when using horse manure in composting or as fertilizer in vegetable gardens or animal pastures. Can these medications harm other beneficial organisms in the soil and what other types of medications can be found in animal manures used as fertilizers or in composting? Could these medications find their way into our food through plants and animals?</p>	
Summary Statement My project is about the effect of parasitic worming medication found in horse manure on red worms in a compost setting.	
Help Received My father helped me gather the 300 red worms from our compost bin and prepare the three compost settings. My mother helped type various parts of my research paper and advised me on the layout of my display board.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) July B. Perreault	Project Number J1528
Project Title Did It Sprout?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to find out if the pH of filtered water affected seed germination.</p> <p>Methods/Materials I adjusted filtered water to pH 2, 3, 4, 5, 6, 6.5, 7, 8, and 9, and used three controls, that were pH 6.5. I soaked corn, mustard, sunflower, and radish seeds in plastic cups with the adjusted waters and then took them out to sprout. I observed how each set of seeds grew and sprouted, and the amount of sprouts that grew each day.</p> <p>Results In the results, I found that the pH of 4-7 and the controls sprouted the most seeds and grew the best sprouts, while pH's 2, 3, 8, and 9, did poorly.</p> <p>Conclusions/Discussion Overall, all of the different kinds of seeds grew the best at a close to neutral pH range.</p>	
Summary Statement I tested how the pH of water effects seed germination?	
Help Received Mother helped set up board. Step Mother helped adjust waters to the right pH's.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jacqueline C. Peterson	Project Number J1529
Project Title Can Plants Adapt to Water Pollution?	
Abstract Objectives/Goals The objective of this experiment is to determine if lima bean plants can form immunities to water pollution. The hypothesis stated if three groups of lima bean seedlings are pre-conditioned with motor oil in concentrations of 1%, 2%, and 5% for 35 days, then they will grow better than the group of plants not pre-conditioned when all plants are exposed to a 50% concentration of motor oil for 10 days. Methods/Materials Twenty-four lima bean seeds were placed in plastic cups and watered with 12.5 milliliters of well water for five days. Next, twelve lima bean seedlings were selected and planted in 1-gallon pots below a fluorescent light for 18 hours a day. The pots were separated into four groups and each group was watered with a specific concentration of motor oil and measured for 35 days, while leaves were measured and pictures were taken at ten day intervals. Results All of the seedlings planted germinated. The experiment showed fewer differences between groups than expected. Although the plants watered with 0% concentration did do best, the plants watered with concentrations of motor oil still grew quite well despite the lack of chlorophyll throughout the plants. This caused some of the bottom leaves to lose their green color and eventually fall off. The plants watered with motor oil were also more fragile and the leaves easily ripped. Conclusions/Discussion During the last ten days of the experiment, groups of plants showed almost no differences. All plants had brown bottom leaves, seed pods, and at least one leaf had broken off. The hypothesis was proven incorrect because groups of plants pre-conditioned with motor oil did not show signs of forming immunities.	
Summary Statement The purpose of this experiment is to determine if lima bean plants can form immunities to water pollution.	
Help Received Mother and father proof read report; Neighbor provided well water from home.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Caitlin C. Russell	Project Number J1530
Project Title Determining If Household Materials Can Neutralize the Toxic Levels of Pesticide	
Objectives/Goals My objective is to determine if i can use household materials to neutralize a toxic spill (pesticide spill) Can I add a liquid to the pesticide to make it a safe environment for a puppy or little child if there was an accidental spill? How will different soils affect how the neutralization works?	
Abstract Methods/Materials I collected a clay loam,sand, and regular backyard soil. I then sprayed pesticide into the different soils. I made liquid bases to add to the pesticide. Soapy water, milk, antacids, and baking soda. I sprayed an equal amount of base to the pesticide on each soil. A total of 15 different trays. (3 soils X 4 bases and 1 control) Control was soil with no base. I then took soil samples from each tray. I added 2 crickets to the soil samples to test if pesticide was still toxic. Recorded death rate of crickets and compared results. This process was repeated for 10 trials, a total of 300 crickets in all. (crickets were obtained from pet store.)	
Results Soapy water proved to be effective in neutralizing the pesticide. On average it worked 83% of the time, and 100% of the time in clay! Milk worked well overall, but especially well in clay. Antacids did not prove to be very effective. The antacid base worked at times, but nothing consistent or reliable. Baking soda proved to be very weak, to non-existent when being used to neutralize the pesticide. All of the bases worked better on the Clay Loam. This was most likely due to the fact that the pesticide did not seep into the clay. The base made direct contact with the pesticide when placed on the clay.	
Conclusions/Discussion If you had a toxic spill (pesticide) you could use soapy water to help neutralize the toxicity of the spill. Especially if you can add it directly to the spill. (direct contact, before it seeps into the soil) Milk also works, but my results showed it wasn't as reliable. If you have a small pet, or child, adding the soapy water to the spill will help make it a safer place.	
Summary Statement I will show how household liquids can help neutralize a toxic (pesticide) spill, by adding it directly to the spill.	
Help Received Parents helped obtain materials, supervised spraying of pesticide, and helped put board together.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Connor A. Schroeder	Project Number J1531
Project Title Cytoplasmic Streaming: The Effects of an Electromagnetic Field	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project, Cytoplasmic Streaming The Effect of an Electromagnetic Field, is to see if an electromagnetic field (EMF) could either slow or quicken the process of cytoplasmic streaming (cyclosis).</p> <p>Methods/Materials I used many methods for doing my project. First I would have a control with no EMF and would time the speed of the chloroplast moving one cell length. I had to use the same cell for each test because cyclosis rates differ from cell to cell. Then I would gradually increase the EMF's strength to 14 gauss-- gauss is the measurement of an EMF's strength-- and tested all of those using the same cell and length.</p> <p>Results In my project I found that as I increased the gauss of the EMF, the cytoplasmic streaming velocity increased from 56 seconds to 12 seconds to travel the same cells length. My discovery was absolutely contrary to my hypothesis.</p> <p>Conclusions/Discussion My hypothesis states that as the electromagnetic field's gauss increases the cytoplasmic streaming will become slower. Now that I have all of my test results, I completely disagree with my hypothesis. The cytoplasmic streaming's velocity increased by a total of about 43 seconds from no field to 14 gauss. This was a major discovery for me and I began to question if an electromagnetic field could effect the oxygen intake and carbon dioxide could change due to a velocity change in cyclosis. This in turn could be connected to green house gases in our atmosphere because of the fact that carbon dioxide is a major green house gas.</p>	
Summary Statement My project is to see if an Electromagnetic field could effect the process of cytoplasmic streaming.	
Help Received Mr. Demcak - information , Mr. Peterson - information / equipment	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Rebecca Su	Project Number J1532
Project Title How Do Electromagnetic Fields Affect Plants?	
Abstract Objectives/Goals The goal of this experiment is to determine how electromagnetic fields, specifically those of different strengths and directions, will affect plants. Methods/Materials A DC-powered apparatus was built to generate the electromagnetic fields. 84 cloves of garlic were divided into Groups A, B, and C. After a 3-day germination period, Group A was exposed to a strong electromagnetic field, and Group B was exposed to a weaker field. Within the experimental groups A and B, half were exposed to an upward-facing field and half were exposed to a downward-facing field. After two weeks, the final measurements of all the subjects were recorded. The trial was repeated 2 more times. Results On average, the Group A (up) subjects grew approximately 7% shorter than those of the control, while the Group A (down) subjects grew 7% taller. By contrast, the Group B (up) subjects were 4% taller than the control, and Group B (down) subjects were 3% shorter. Conclusions/Discussion The results imply that stronger electromagnetic fields have more significant effects than weaker fields. Whether these effects are positive or negative depend on the field strength and direction; while Group A (up) had negative effects and Group A (down) had positive effects, the opposite result was evident in Group B subjects. Therefore, in future experiments, it is important to note both the electromagnetic field strength and direction as significant factors affecting the subjects.	
Summary Statement The purpose of this experiment is to examine how electromagnetic fields affect plant growth.	
Help Received Mother helped build apparatus; father provided information on plant biology.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Ali N. Tradonsky	Project Number J1533
Project Title Does Method of Delivery of Chemotherapy Affect Cancer Cell Death?	
Abstract Objectives/Goals Introduction: In 2008, approximately 142,070 Californians will be diagnosed with cancer. Most will receive expensive intravenous chemotherapy, which causes harmful side effects. If locally injecting chemotherapy into a tumor is effective in causing cell death, systemic side effects may be reduced, and costs lowered. Problem: Is delivering chemotherapy to a cancer sample by direct injection as effective as delivering the same chemotherapy, in the same dose, to an identical sample by passive diffusion? Methods/Materials Thirteen cancer specimens were divided into 3 or 5 equal samples, depending on availability. One sample was fixed in formalin, another injected with chemotherapy, and one exposed to the same chemotherapy in R.P.M.I. solution (diffusion). Where 5 samples were available, one was injected without chemotherapy, and one was placed in R.P.M.I. solution without chemotherapy (negative controls). The tissues were then processed for microscopic examination. Five indicators of cell damage and life cycle disruption were evaluated: mitoses, pyknosis, tissue necrosis, chromatin streaks, and tissue tears. Results were analyzed. Results There was no significant difference in mitoses, pyknosis, or necrosis between the formalin-fixed and negative control samples. Comparing chemotherapy treated samples, there was no significant difference in mitoses for injection versus diffusion. Pyknosis and necrosis were greater in the injection samples. Chromatin streaks and tissue tears were seen almost exclusively in samples treated by injection, with or without chemotherapy. Conclusions/Discussion Delivering chemotherapy to cancer samples by injection causes greater nuclear pyknosis, tissue necrosis, chromatin streaking, and tissue tearing than chemotherapy delivered by diffusion. This study has confirmed the hypothesis that chemotherapy delivered by injection is at least as effective as chemotherapy delivered by diffusion.	
Summary Statement The efficacy of delivery of chemotherapy by direct injection into a cancer sample was compared with the efficacy of delivering the same chemotherapy to an identical cancer sample by passive diffusion.	
Help Received Grossmont Hospital Surgical Pathology Laboratory was the site of all testing under supervision of Scientific advisor Dr. Mair (Surgical Pathologist at Grossmont Hospital); Scientific Consultants: Medical Oncologists Drs. Clune, Zu, and Bodkin; Oncologic Pharmacist at Grossmont Cancer Center.	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Sarah C. Wyman	Project Number J1534
Project Title SpiSEA: The Search for an Environmentally Friendly Solution to Toxic Paints	
Objectives/Goals Can I use strong food substances to create an all-natural, non-fouling algae repellent for boat bottoms?	
Abstract	
Methods/Materials 1 qt oil based primer paint 4 small cups pencil 19# x 7# x 5/8# MDF plank (baseboard material) 4 wooden mixing tools sharpie 4 small paintbrushes painter's tape paper set of measuring cups ruler/yardstick 1/8# spectra line 1 oz Atomic Brand 'Extra Hot' horseradish sauce q-tips small drill bit 1 oz garlic powder digital camera 4 small metal eyelets 1 oz hot New Mexico red chili powder safety goggles 1 large paintbrush 1 drill	
Results The final results left control at the highest with a top growth average of 100, the chili pepper with the smallest average, 70, the garlic, barely above the chili, with 72, and the horseradish at 96.	
Conclusions/Discussion It seemed at first as if the garlic was going to be one of the sections showing the most growth, but while the other sections were developing over the weeks, the garlic stayed consistent with its original growth status. During the first few weeks, # of the sections were marked 10-20 in degree of growth, but the chili pepper stayed between 0-10. Towards the end the garlic seemed to have virtually the same, or less, growth than the chili pepper, but when a q-tip was used to swab the garlic section, the result showed more growth than when the same procedure was conducted on the chili pepper section. Although this experiment was very successful, it definitely had some errors. Because the parts of the plank painted with substances faced down into the water, it took longer for algae to develop through indirect sunlight while the sides directly exposed to sunlight thrived. This could have been solved by securing the plank to the dock so it tilted towards the surface at a slight angle. It is also possible that the results would have been different if a surface curved like a boat hull had been used. I should also have had a section on my plank with toxic paint so that I could compare and contrast this section with the other sections on my plank. Because oceans and harbors all over the world are different and the water conditions, pollution, weather, and salinity vary it is difficult to get the same exact result twice. Because both the chili and the garlic both showed less growth than the control, there is still hope for a solution to the growing worldwide problem of toxic boat bottom paints.	
Summary Statement Chili pepper can be used to create an environmentally friendly alternative to toxic boat bottom paints.	
Help Received Father helped construct plank	



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Laura M. Zablit	Project Number J1535
Project Title Hot Ladybugs	
Abstract Objectives/Goals This experiment's goal is to determine the positive and/or negative effects of heat on ladybugs' speed, strength, flight, and activity. Methods/Materials 1,200 ladybugs were tested in 6 groups 200. Each group was placed in a terrarium with a reptile heater placed at a fixed height above the tank to radiate a certain temperature, either 70°F, 80°F, 90°F, 100°F, 110°F, or the control group, which was placed separate from the other tanks, temperature the same as the room#s. Ladybugs were under these conditions for 4 days in Trial 1 and 8 days in Trial 2. Results In the end, the highest average ladybug activity was in the 80°F, the highest average ladybug speed was in the 110°F tank, the highest average ladybug strength was in the control tank, the 70°F tank, and the 80°F tank all tied, and the highest average ladybug flight was in the 110°F tank. The lowest average ladybug activity was in the control tank and the 100°F tanks. The lowest average ladybug speed was in the 70° tank. The lowest average ladybug strength was in the 110°F tank. The lowest average ladybug flight was in the control tank, 70°F tank, 80°F tank, and 90°F tank. Conclusions/Discussion In higher temperatures, the ladybugs moved faster and flew more often. In higher temperatures ladybugs also grew weaker; they fell off the sides and ceilings of the tanks more often. Ladybug activity was the highest at 80°F, and the colder the temperature, the less ladybugs move. It is clear that although heat speeds the chemical reactions that give the ladybugs energy (as they are cold-blooded) and causes the ladybugs to move faster and fly more, although the adhesion is then lessened.	
Summary Statement This project was conducted to observe how higher temperatures affect ladybugs, because with the forecasted temperature rise, it is important to take care of ladybugs because their existence is fundamental to ours.	
Help Received Father payed for supplies. Mother helped with transportation and handling heat lamps.	