



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Daniela N. Alvarez	Project Number J2301
Project Title Will Increased Levels of Acid Affect Bean Seed Germination?	
Abstract Objectives/Goals The purpose of this project was to find out if acid rain affects seed germination. For this purpose I used different levels of acidic solution of white vinegar with water. I used the following amounts: 0% vinegar- 100% water 10% vinegar- 90% water 20% vinegar- 80% water 30% vinegar- 70% water 40% vinegar- 60% water 50% vinegar- 50% water 60% vinegar- 40% water 70% vinegar- 30% water 80% vinegar- 20% water 90% vinegar- 10% water 100% vinegar- 0% water The vinegar used in this experiment is obviously not falling from our sky, but it is a good substitute for sulfuric acid that comes with rain. Vinegar is a goo substitute because as acidic as the pollutants in acid rain. Methods/Materials I soaked ten bean seeds in each of the different acidic solutions for 24 hours before plant them in soil. I wanted to find out how acid rain affects a plant's seeds before they were planted for germination, even though they looked healthy. I placed the seeds and marked them according to % of vinegar and water. I observed them for two weeks. Results The results of this experiment confirmed my hypothesis that seeds with lower level of acid will germinate. Actually, the only bean seed that sprouted were the ones soaked in pure water (pH=7), the others didn't germinate. Conclusions/Discussion The experimental data shows that the seeds soaked in pure water sprouted and the seeds soaked in a solution with any amount of vinegar died. As i observed my experiment I noticed that something like fungus came out of some seeds. After the two weeks my experiment lasted, I tried to find the seeds and see what happened to them. I just found some of them, it looks like some decomposed and got melted	
Summary Statement The purpose of this project was to find ou if acid rain affects seed germination.	
Help Received Mom hlped with the board, Dad bought materials needed	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Roy G. Ambrose, III	Project Number J2302
Project Title The Effects of Everyday Chemicals on Grass and Plants	
Abstract Objectives/Goals I decided to do this project because I noticed when my dad was putting out fertilizer it had different effects on the plants and grass. I noticed that the grass died in certain spots, in other spots it grew long and thick and some plants grew larger, I became curious why this happened so, I wanted to know if other household chemicals would have a negative effect on grass and plants. Methods/Materials In order to perform my test in a natural environment with different types of plant groups, I had to design a plant holder for my specimens. I needed a box that was 16" x 24". I also had to divide the box into different section for my controlled groups and I had to create separate section for the sod.The plant groups used in my experiment were mosses, liverworts, ferns, flowering plants and grasses. Results After my first week of testing I noticed in row 1, the oil mixture, two out of the three plants were showing changes. I noticed that the plants treated with grey water 4A, 4B, 4C, and, 6A-Control group showed the healthiest results at this time during testing.During the second week of testing group 1 the oil mixture again showed negative results. During the final week of testing group 1 the oil mixture plant 1A continued to show major color change and larger brown and black spots. Specimen 1C now had a large amount of yellow and brown grass blades. In the center of section 1C there was a large dirt spot were all the grass had died. Group 2 the car wash mixture plant 2A had collapsed. Group 3 the toothpaste mixture plant 3B also collapsed. Plant 4A the grey water remained the same the only noticeable effect was the dry flower petals, but leaves remained healthy. Plant 6A control group was healthy and strong. Conclusions/Discussion At this point based on the results of my experiment I must conclude that my hypothesis was partly wrong. At the beginning of the experiment I stated my hypothesis that #Chemicals would have a negative effect on plants and grass, but the plants would be more tolerant to the chemicals#. From my observation plant 2c-grass, 3c-grass and 4c-grass which were all treated with different chemicals showed no changes in color, texture and dryness. During my project I learned through observation that some forms of used water might be re-usable for outside uses.	
Summary Statement I am going to try to determine the direct effects that certain household chemicals such as toothpaste, paint, oil, grey water and carwash has on our natural environment such as plants and grass.	
Help Received Parents assisted with graph and safety supervision.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Abby E. Bart	Project Number J2303
Project Title Flipped Out Fish	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals In my science project, Flipped Out Fish, I gave goldfish different substances to see how the goldfish reacted. I used caffeine, nicotine, sugar, and alcohol. I tested the goldfish breathing and watched their behavior.</p> <p>Methods/Materials For each substance I used, I tested the fish with five concentration levels. For each concentration level, I tested two fish. I tested the fish by putting two fish in a clear plastic cup filled with water along with the right amount of the substance I was testing, and then waited five minutes. I then counted the respirations of each fish in sixty seconds by watching their gills. I tested each fish three times and averaged the numbers. In addition, I watched and took notes about the fish behavior. I also tested two fish in normal water for my control fish.</p> <p>Results In the end, nicotine affected the fish the most. When the fish had nicotine in their water, their behavior was slower - they didn't move much, and it slowly decreased the respirations of the fish as the concentration levels increased. Caffeine affected the fish second most. While it did not affect their behavior or breathing, it was slowly weakening the fish. Sugar affected the fish third most. It did not affect their breathing, but visually, it made them very hyper. Alcohol affected the fish the least. It did not affect their behavior at all, though there was a slight increase in their breathing as the concentration levels increased.</p> <p>Conclusions/Discussion After running the experiment, I discovered that my original hypothesis, that alcohol would affect the fish the most, was wrong, probably because alcohol is a depressant, while all the other substances are stimulants. I also discovered that counting respirations is not the best way to measure the affects of substances on goldfish. The respirations do not have very clear, visible patterns, and the only substances that affected the fish breathing were alcohol, which had a very slight affect, and nicotine. If I could re-do my project, I would find a better way to measure the affects. One more thing I wondered, after running the experiment, was what would happen if the fish were given more alcohol? I didn't give them a lot, and I wonder how more would affect them.</p>	
Summary Statement My science project I gave goldfish nicotine, caffeine, sugar, and alcohol and measured the affects by watching their behavior and counting their breathing.	
Help Received My mom helped run the timer while I counted breathes.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Ashley Cable; Naiya Ingram-Villagrana	Project Number J2304
Project Title What Is Acid Rain and How Does It Affect Tomato Plants?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to learn what happens to tomato plants when they are exposed to different levels of acid rain and if the effects can be neutralized through simple chemistry.</p> <p>Methods/Materials We had four tomato plants. Plants 1 and 2 were fed different concentrations of a sulfuric acid and spring water solution (pH 4.0 & 4.5), Plant 3 was fed the pH 4.5 solution and a lime neutralizer and Plant 4, the control, was fed spring water. We fed them all # oz. of their assigned solution every other day for three weeks. At recorded intervals we noted changes in the plants, such as height and yellowing.</p> <p>Results Plant 1 was dead by the end of three weeks. Plant 2 was almost dead, though not as brittle and droopy. Plants 3 and 4 were just about as green but the neutralized plant was smaller, showing that the acid rain still had a slight effect on it.</p> <p>Conclusions/Discussion The plants fed the acid rain solutions died. Adding the lime to Plant 3 was successful in protecting it. However, it was still hard for the neutralized plant to grow as fast as the control. This may be because the acid had a slight effect on it or it got too little acid, since tomato plants prefer slightly acidic soils. Our results supported our hypothesis and demonstrated the beneficial effects of adding lime.</p>	
Summary Statement We used the scientific method to demonstrate the effects of acid rain on tomato plants and how these effects might be chemically neutralized.	
Help Received Father made the acid rain and helped organize the text; Mother helped organize display board	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Casey M. Campos	Project Number J2305
Project Title How Does Herbicide Temperature Affect the Killing of Undesirable Plants?	
Abstract Objectives/Goals The purpose of my science fair project is to discover a less toxic and less expensive way to kill undesirable plants by altering herbicide temperature before its application. Methods/Materials Fescue sod was placed into four labeled trays, and each tray was divided into six sections (creating 24 test sections). 75% of the recommended dosage of Roundup herbicide was poured into a spray bottle and unheated water (67 degrees Fahrenheit) was added. The mixture was then sprayed (three controlled squirts per section) onto the grass using a spray shield, controlling any overspray. The grass was observed for signs of herbicide effectiveness. This procedure was repeated for each variable: water heated to 160 degrees Fahrenheit (F) and water heated to 200 degrees (F); and the mixture sprayed onto the sod in the same manner. Each variable, like the control group, had 24 test sections. Results The least effective diluted herbicide was the control group of an unheated mixture that turned the grass yellow, but never actually killed the grass. The grass also showed signs of rejuvenation after initial yellowing. The most effective diluted herbicide was the second variable heated to 200 degrees Fahrenheit. This mixture took eight days to completely burn/kill the targeted grass and the surrounding areas. Overall, the diluted herbicide at a temperature of 160 degrees Fahrenheit was 71% more effective than the control trials at killing the undesirable plants, and the diluted herbicide heated to 200 degrees Fahrenheit was 92% more effective at killing the unwanted plants. Conclusions/Discussion My conclusion is that herbicide temperature plays an important role in its effectiveness. People who spray their weeds can use less of the herbicide mixed with water heated to 160 degrees Fahrenheit or warmer to increase the effectiveness of killing unwanted plants. This experiment suggests that people can save money and reduce chemicals released into the environment by using hot water to dilute concentrated Roundup.	
Summary Statement Heating an herbicide while using 25% less of the recommended dosage is extremely effective at killing undesirable plants.	
Help Received Mother helped lay-out board and took pictures while I did the procedure	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Emily K. Denny	Project Number J2306
Project Title Diesel Ducks and Gassy Grebes: How Fuel Spills Affect Birds	
Abstract Objectives/Goals My project is to determine which fuel, gasoline or diesel, is most damaging to a bird's ability to insulate itself. Methods/Materials Nine chicken breasts (bone in, skin on) were cooked in an oven to 325 degrees F. for 25 minutes each. When they were removed from the oven, the breasts were covered in bird feathers that were soaked in either gasoline or diesel fuel, or in dry feathers. I measured the drop in temperature of the chicken breasts for 45 minutes. Results The gasoline and diesel fuel both had an average temperature loss of 0.54 degrees F per minute. The chicken breast covered in dry feathers had an average temperature loss of 0.34 degrees F per minute. Conclusions/Discussion I found out that gasoline and diesel fuel have the same effect on the insulating quality of a bird's feathers. I also found out that feathers not soaked in any kind of fuel will insulate a bird more effectively.	
Summary Statement My project will determine which oil is most damaging to a bird's ability to insulate itself, gasoline or diesel fuel.	
Help Received My Dad helped me with the project by supervising when I was working with hazardous fuels. I had help in my research from the Sequoia Park Zoo and the Humboldt Wildlife Care Center.	



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Camille Didelot Hearn; Galen Dodd; Alison Sanford	Project Number J2307
Project Title Attack of the Whiteflies	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals After noticing whiteflies on a plant at school, we decided that we would like to test ways of controlling them. After doing research and learning that synthetic pesticides are most commonly used for whitefly control, we became determined to find a more efficient, cost effective, and ecologically friendly way of controlling whitefly population.</p> <p>Methods/Materials We planted 20 Bonnie Hybrid Cabbages in separate cages, making 4 different groups of 5 plants each. Each plant was infested with 50 Greenhouse Whiteflies. Triazicide and Organocide we both mixed according to the manufacturer's instructions. The plants in those two experiment groups were sprayed three times a day for the one week test period. 10 ladybugs were introduced into each of the 5 plant cages of the third experiment group. The fourth group was left untreated as a control group. All plants were watered daily. A population count of whiteflies was taken every day for a week and the results recoded for analysis.</p> <p>Results When Triazicide, Organocide, and Lady Bugs were tested; the Lady Bugs were found to be the most effective and environmentally friendly method of controlling a whitefly population. In most trials, the Whiteflies sprayed with Triazicide and the Whiteflies controlled by a population of Lady Bugs died out completely after 4-5 days. The Lady Bugs are known to be a more natural, and non-toxic, method of eradication than the Triazicide. The Organocide has mixed results, usually leaving 10-15 Whiteflies still alive, but sometimes killing them all. Our experiment demonstrates that Lady Bugs are the fastest, cheapest, and most environmentally friendly method of Whitefly control.</p> <p>Conclusions/Discussion Through this experiment, we found that both ladybugs and chemical pesticides effectively eradicate whitefly infestations in about the same time period. However, the chemical pesticide was able to accomplish this in a faster time period (four days) than the ladybugs (five days). Unfortunately, our hypothesis was incorrect- the Triazicide was most effective (in speed), followed by the Ladybugs, and lastly, the Organocide. The most obvious unexpected result was that the Triazicide was the best in eradicating the whiteflies. Another unexpected result was that some of the Ladybugs disappeared, which could be linked with ladybug cannibalism or faults in the cage system.</p>	
Summary Statement Our project set out to compare effectiveness and cost of competing pest control methods.	
Help Received Consulted with professionals in planning and hypothesis stage; material support from parents; teacher support in class	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Shannon V. Foy	Project Number J2308
Project Title How Do Liquid Pollutants Affect Radish Growth, Germination, and Appearance?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project is to see how three different liquid pollutants: motor oil, paint, and laundry detergent, affect a radish seeds germination, growth, and appearance. In addition, how do these three groups react in comparison to one control group? I hypothesized that the motor oil will have the worst overall results and that the control group will have the best overall results in the plant's germination, growth, and appearance.</p> <p>Methods/Materials I used 24 medium-sized plastic cups, backyard soil, a ruler, liquid measuring cup, Formula Shell motor oil, Sun Burst liquid laundry detergent, and Speed-Wall white paint. I then separated the 24 cups into 4 groups of 6 cups labeling each group either A-D and the cup number (i.e. A1, D3) I planted three radish seeds equal distance apart and watered them with 50 ml of water. After one day, I gave Group D its 50 ml of water but then gave the rest, Groups A-C, 20ml of their designated pollutant and 30 ml of water to fulfill the 50 ml of liquid every other day. I set them by a window; not wanting the temperature as a variable, and each received the same amount of sunlight. I watered, measured, and recorded observations for 35 days.</p> <p>Results The results for Group A, motor oil, had an average growth of .33cm. Group B, paint, was .0015cm. Group C, laundry detergent, was 0cm. And Group D was 2.71cm.</p> <p>Conclusions/Discussion It turns out that my hypothesis was somewhat incorrect. I was right in assuming that Group D would have the best results, but I hypothesized Group A, motor oil, would have the worst results when it actually had the 2nd best results. Group B came in 3rd and Group C ended up in last. During my research, I discovered the laundry detergent actually had the most toxic ingredients such as some Quatemium, Xylene Sulfonate, and Petroleum. Also, I thought about how crude oil is found at the bottom of the ocean by decomposition. Motor oil is a refined version of crude oil, thus making it very similar and organic. If I could do this project again, I might make it more complicated by using the temperature as a variable to see the reaction in a more natural setting. I also might take the mass of the plant and soil to see how much the soil actually absorbed with the pollutant or grow the plants for a longer period of time to get more solid numbers.</p>	
Summary Statement My project is about the affect that liquid pollutants have on radish seeds' growth, germination, and appearance in backyard soil.	
Help Received Dad bought seeds, cups, paint, detergent, and motor oil and science teacher helped with planning and idea.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Yesenia Guerrero	Project Number J2309
Project Title Effects of Pharmaceuticals on Plants	
Abstract Objectives/Goals The objective of this project was to find out the effect that Children's Tylenol Plus Cough and Runny Nose has on rosemary plants. Methods/Materials Fifteen rosemary plants were divided into three groups of five. The first two groups were given Children's Tylenol Plus Cough and Runny Nose combined with water. One of these groups was given more medication (5mL more). In the third group, medication was not used at all; only water. This was done every night for twenty-one days. Plants were observed every day, and one ruler was used to measure their growth and wilt. Results The two groups of plants that were exposed to Children's Tylenol Plus Cough and Runny Nose were greatly harmed. But the plants with the most medication, drooped faster and two centimeters more than the plants with less medication, which wilted five centimeters. Most of the plants in the group in which medication was not used, did not have that many changes, except that they grew about two centimeters. Conclusions/Discussion Children's Tylenol Plus Cough and Runny Nose, like many other drugs, can end up contaminating the soil when they are disposed of improperly. An ingredient in this medication- synthetic nitrogen- harms the soil, and therefore, the plants. The damage that this product can cause to plants, is shown in the way that the rosemary plants were affected becoming brittle, stiff, and surviving no longer than three weeks. This information should help people to be more careful in the way they get rid of their unwanted pharmaceuticals.	
Summary Statement My project is about the harm that pharmaceuticals can cause on plants.	
Help Received My older sister helped me organize my ideas; my mom helped me w/ my poster board.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Caroline C. Ho	Project Number J2310
Project Title Natural and Effective Ant Repellents	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine which food items repel ants best. I hypothesized that if I introduced horseradish, blue cheese, black pepper, and cinnamon to ants as an obstacle to obtaining honey, the cinnamon would repel the ants best.</p> <p>Methods/Materials First, I measured one teaspoon each of cinnamon, black pepper, blue cheese, and finely chopped horseradish (sliced by my father) and four portions of a teaspoon of honey. Next, I filled four bottle caps (with part of the rim cut off to ensure that ants could reach the honey) with one portion each of honey and placed them outdoors near ants. Then, I spread each test repellent around its own cap. Finally, I recorded how many ants penetrated each repellent barrier to access the honey in a time slot of 10 minutes. The materials I used were a responsible adult, a 1 foot by 3.5 feet outdoor level area containing ants for doing the experiment, a plate for placing the test repellents, a clean cutting board, 4 plastic water bottle caps, scissors, a pencil and notebook to record data, a sharp knife, a teaspoon and tablespoon measurer, four teaspoons of honey, 1 teaspoon each: ground black pepper, cinnamon powder, and blue cheese (block); and horseradish (washed and peeled root).</p> <p>Results The ants were best repelled by the cinnamon, which no ants went near. Black pepper earned an average of 15 ants penetrating it; blue cheese and horseradish each received an average of 50 ants. These results support my hypothesis.</p> <p>Conclusions/Discussion In conclusion, this project shows that ant repellents should include cinnamon, which best repelled the ants; it is humane, environmentally friendly, and not a health hazard, so it can be used around the household without irritating children and as an alternative to pesticides.</p>	
Summary Statement My project was about determining which food item(s) best repelled ants: horseradish, blue cheese, black pepper, or cinnamon.	
Help Received My parents bought the materials and chopped the horseradish, and my science teacher and classmates suggested improvements for my report.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Jason C. Kandu	Project Number J2311
Project Title Killer in the House	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal is to find out the result of household cleaners infecting radish plants and see what can be changed to help the environment</p> <p>Methods/Materials Radish plants were used because the radish grows underneath the soil, causing it to take the full influence of the cleaners. The radishes were watered with their designated solutions by bottles filled with their mixtures every 2 days</p> <p>Results The first couple of groups, detergent, detergent and chlorine, and eco-friendly detergent had very similar outcomes, small plants and leaves, then having a slow death. The next categories, soap and eco-friendly soap, had the same results as well, an immediate death to all the plants within several weeks# worth of watering. Windex and eco-friendly Windex had neutral effects; both groups grew averagely, with a regular or normal size. Toilet bowl cleaner and eco-friendly toilet bowl cleaner had very surprising outcomes. The toilet bowl cleaner did well at first; however all of sudden its stem and leaves turned thin and brown, and then wilted to the ground. On the other hand, the eco-friendly toilet bowl cleaner had very positive results and grew almost as well as the control. Its height was large, along with its numerous leaves and its healthy, green color. The control, water, was the largest of them all and had the best leaves, healthy, green and huge</p> <p>Conclusions/Discussion The detergent had the ingredient Triclosan, which is very dangerous for humans, but has an opposite reaction with plants. Plants trap the Triclosan in their soil until it is harmless and does not cause any breathing problems. Chlorine is surprising, since it is also a deadly chemical, but it is actually organic and was good for the plants. The eco-friendly detergent has chemicals such as soap that covers the roots of the plant and preventing any nutrient from being absorbed. The soap and eco-friendly soap is expecting, since soap#s reaction with plants is to block the roots from being sucked up just like in the eco-friendly detergent group. The Windex and eco-friendly Windex both have ammonia, which is used for a fertilizer so it improves the growth rate of the plants. The toilet bowl cleaner transfers chlorides through the plants stomata, causing carcinogens to build up, which explains the deaths. The eco-friendly toilet bowl cleaner has no bleach and no chlorine and no bad chemicals, just lemon oil which provided food for the plants</p>	
Summary Statement The purpose of this experiment is to find out how chemicals in household cleaners can change how a radish plant develops.	
Help Received Mother helped record measurements and make solutions; Father helped edit drafts; Scientists, Ken Rubin, Dina Lopez, and Phoebe Chang, helped give ideas on how to test	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Daniella Khersonsky	Project Number J2312
Project Title Tipsy Daphnia	
Abstract Objectives/Goals The purpose of this experiment is to examine the long and short-term effects of alcohol on a Daphnia's heartbeat. Methods/Materials <ol style="list-style-type: none">1. Hook up a sergeant waltch model 411tbl double lens microscope to a document camera with a microscope attachment.2. Place a drop of Ethanol into a deep well depression slide.3. Then place about .75ml of Daphnia and their culture into the same deep well depression slide.4. Once you focus on a Daphnia start counting the amount of times the heartbeats.5. To count the amount of times the heartbeats use a stopwatch and a counter. Make sure to start the stopwatch and the counter simultaneously.6. Once you lose focus of the Daphnia stop the stopwatch and the counter. On a sheet of paper record the time on the stopwatch and the number on the counter.7. Using the following mathematical equation, the number of times the heart beats divided by the time, times sixty, to get the number of times the heartbeats per minute.8. Average all of the beats per minute together to get the total beats per minute Results The short-term effect of alcohol on a Daphnia's heartbeat is a 4.9% increase of BPM from that of the heart rate of a Daphnia that has not been exposed to alcohol. The long-term effects of alcohol on a Daphnia's heart rate are: a 32.5% increase of BPM over 110 minutes from the heart rate of a Daphnia not exposed to alcohol; an increase in the heart rate, which is followed by a decrease, which is lead by another increase during which the heart rate reaches its highest peak, then plateaus for approximately 10 minutes. After which the heart rate declines to zero BPM, recorded at 110 min after introduction of alcohol into the Daphnia's system. Conclusions/Discussion In this experiment the hypothesis was proven to be correct. When ethanol is added to a Daphnia's system it causes the heart rate (bpm) to increase, then decrease, then increase again, reaching the highest peak, which is then followed by a plateau for approximately ten minutes. After which the heart rate declines to zero, most likely due to the fact that the heart cannot withstand the pressure caused by such an erratic and rapid heart rate. The erratic behavior of the Daphnia's heart beat when exposed to alcohol for a long a period of time is similar to the way a human heart reacts during a heart attack.	
Summary Statement The affects of ethanol and a Daphnia's heart rate	
Help Received NO	



**CALIFORNIA STATE SCIENCE FAIR
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Name(s) Sarah E. Klein	Project Number J2313
Project Title Growin' in the Rain	
Abstract Objectives/Goals The purpose of my experiment was to determine whether an acidic solution (acid rain) affects the rate in which a radish shoot emerges from the soil. My hypothesis was that the radish seed group, or control group, that received water only, would emerge the fastest. Methods/Materials My materials included Champion radishes that germinate within four to seven days, distilled white vinegar, which simulated the acid rain, five planters for each group for a total of 20 planters, and Organix Soil. Planters were placed in four groups, five in each group. Six seeds were planted in each pot at 1/2 inch depth. The control group received 50ml of tap water, Group A received 49.5 ml of water and .5 ml of vinegar. Group B received 49ml of water and 1.0ml of vinegar, and Group C received 48.5ml of water and 1.5ml of vinegar. Water solutions were tested for their pH level. Plants were watered every two days. Plants were observed and recorded for seven days. Results The results showed that the seeds in the control group emerged from the soil within five days. Groups A, B, and C emerged by the sixth day. Conclusions/Discussion I proved that my hypothesis was correct. The Control group with no acidity in the water, emerged from the soil the fastest. In conclusion, the acidic solution did affect the growth of radish seed development.	
Summary Statement Does acidity in soil (acid rain) affect the rate in which a radish seed emerges from soil.	
Help Received My mother edited for typing only.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Karley J. Lassley	Project Number J2314
Project Title Which Local Plant Extracts Will Be an Effective Pesticide on Mosquito Larvae and Still Be Safe for Other Aquatic Life?	
Abstract Objectives/Goals The purpose of my science project is to determine if local plant extracts will kill mosquito larvae and still be safe for other aquatic life. The reason I am doing this project is to find a natural pesticide for mosquito larvae that will not cause harm to other living creatures in our environment. Methods/Materials For my control I will place 10 mosquito larvae in a container filled with water. In my next test I will place 10 mosquito larvae in a container filled with 15% oleander extract and 85% water. In the next test I will place 10 mosquito larvae in a container filled with 5% oleander extract and 95% water. In the next test I will place 10 mosquito larvae in a container with 15% chrysanthemum extract and 85% water. In the next test I will place 10 mosquito larvae in a container with 5% chrysanthemum extract and 95% water. I will repeat all of these tests using 10 frog eggs in place of mosquito larvae. Results The results of my science project; Which local plant extracts will be an effective pesticide on mosquito larvae and still be safe for other aquatic life? I have found that of the variables used neither the chrysanthemum or the oleander would be safe to use in our ponds to kill mosquito larvae. Conclusions/Discussion After completing my project; Which local plant extracts will be an effective pesticide on mosquito larvae and still be safe for other aquatic life? I have found that my hypothesis for both oleander and chrysanthemum were incorrect. While both were very effective in killing the mosquito larvae they both also damaged the frog egg sack.	
Summary Statement To determine if local plant extracts will be an effective pesticide for mosquito larvae and still be safe for our environment..	
Help Received Mother helped with typing and photos. UC Davis supplied mosquito larvae and mosquito information..	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Katie R. Lefley	Project Number J2315
Project Title Exhausted Grass	
Abstract Objectives/Goals My objective was to determine if engine exhaust had an effect on the growth rate of plants. I also wanted to determine if exhaust from a lawnmower had more of an effect on growth than cleaner exhaust from a car with emissions controls. Methods/Materials I used seven jars and in each jar I grew nine seeds. After I had planted the seeds and watered them with a measured amount water, I drilled a hole in the caps and screwed them on. I used a syringe to add the correct percentage of exhaust to each jar. After I had put the exhaust in the jars I sealed off the hole with hot glue. After the seeds had germinated, I measured the length of each grass leaf every day until they had reached the top of the jar. Results The data showed that both types of exhaust had a negative affect on the growth rate of grass. In both tests, the control grew the best. However, overall the grass growing in car exhaust only grew slightly better than the grass growing in lawnmower exhaust. Conclusions/Discussion The data support the hypothesis that engine exhaust affects the growth rate of plants negatively. The data also support the hypothesis that lawnmower exhaust affects the growth rate more than car exhaust, but only slightly. One possible source of error were the seeds because they all grew at slight different rates. My results were surprising because the jars with 32% exhaust gas did not affect the growth rate much more than the jars with 1% exhaust.	
Summary Statement The objective was to measure the effect of engine exhaust on the growth rate of plants, and to see if exhaust from a lawnmower had a greater effect than cleaner exhaust from a car with emission controls.	
Help Received Dad helped put exhaust in jars; Dad help with line graph	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Tori C. Nishimoto	Project Number J2316
Project Title Investigating the Effects of Automotive Fluids on the Hatching Rate of African Dwarf Frog Eggs	
Abstract Objectives/Goals I wanted to determine which automotive fluids are the most and least harmful to our environment. Methods/Materials Three African Dwarf frog eggs were placed into each compartment of a silicone ice cube making tray containing 15 slots. Each ice cube tray had 45 frog eggs that were each exposed to an automotive fluid. Each ice cube tray contained a different automotive fluid. I recorded the hatching rate of each pollutant. Results Zero percent of the frog eggs exposed to the used antifreeze hatched. The eggs in the unused antifreeze also had a hatching rate of zero. The unused motor oil had the highest hatching rate at about 49% out of all the pollutants I tested. Conclusions/Discussion All automotive pollutants,if not properly disposed, can be very harmful to our environment.	
Summary Statement All automotive pollutants are harmful to our environment, so we need to make sure we properly dispose of them.	
Help Received Parents helped put board together and make revisions; retired science teacher helped get frog eggs for me	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) John M. Perry	Project Number J2317
Project Title The Ability of a Dove Weed Extract to Control Aphids	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if an extract of the Dove weed could be used as an insecticide and be comparable to an over the counter insecticide, Acetamiprid, in the control of Rose Aphids.</p> <p>Methods/Materials I collected Dove weed, created a liquid extract by grinding the plant leaves and stems, filtered the extract to remove plant parts, initially applied the extract to iris leaves with Iris Whiteflies. After the initial success I expanded the testing to Rose Aphids in roses and added the Acetamiprid as a comparison. I included 1 versus 2 applications of both treatments. I counted the live and dead aphids in all treatments.</p> <p>Results The 2 untreated sites had 17 and 42 live Rose Aphids and 0 dead aphids present. The single application Dove weed extract site had 10 live and 32 dead aphids or 76% control. The single application Acetamiprid site had 3 live and 37 dead aphids or 92.5% control. The 2 application Dove weed site had 1 live and 23 dead aphids or 95.8% control. The 2 application Acetamiprid site had 0 live and 26 dead aphids or 100% control.</p> <p>Conclusions/Discussion From discussions with my 7th grade teacher, I learned that Native Americans used Dove weed to stun and catch fish. After researching on the internet, I found that an Indian researcher had tested Dove weed for the control of cross striped cabbage worms. From this information I decided to test a Dove weed extract on whiteflies and aphids. The results of my tests shows that an insecticide based on the Dove weed extract could be a successful alternative to currently used products for whiteflies and aphids.</p>	
Summary Statement The comparison of Dove weed (also known as Turkey Mullein) extract to the insecticide Acetamiprid for the control of rose aphids.	
Help Received My father provided guidance and supervision of the project and my mother helped with the board. Dr. Sam Wells from the Bayer CropScience Fresno Field Research Station, assisted with the use of equipment for counting the aphids.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Gregory M. Regan; Gregory P. Sumen	Project Number J2318
Project Title The Effects of Aluminum on Vanessa cardui	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of our project was to see if aluminum had a biological affect on the life cycle and reproduction of <i>Vanessa cardui</i>, also known as the Painted Lady Butterfly. This is important because aluminum and its compounds are used in many products that people use and consume everyday, including food, antiperspirants, vaccines, make-up, soda cans, antacids and cooking pans. The FDA has stated that the issue of aluminum toxicity is not resolved and needs further research.</p> <p>Methods/Materials We mixed four different concentrations of aluminum chloride hexahydrate, 0.04%, 0.2%, 0.4% and 4%, into the food of 250 larvae and observed the effects over 79 days. We recorded the effects of the aluminum on the transformation of the larvae into chrysalides, the emergence into butterflies, and the production of eggs.</p> <p>Results Our experiment showed a significant affect on the health of the larvae and butterflies. The larvae that were fed the higher concentrations of aluminum had a lower rate of transformation into chrysalides, more mutations and more deaths. Similarly, the butterflies from these larvae had a lower rate of emergence, more mutations, and produced fewer eggs. These effects were greater as the concentrations of aluminum increased.</p> <p>Conclusions/Discussion Our results showed that aluminum had a negative biological effect on the <i>Vanessa cardui</i>. Some of our research supported this conclusion and found a link between aluminum and Alzheimer's, and possibly breast cancer. Other studies disagreed. Our experiment suggests that aluminum may have even more widespread effects on an organism. Until further studies are completed, we should be more cautious of the amounts of aluminum we use and consume.</p>	
Summary Statement Our project tested the toxicity of aluminum on <i>Vanessa cardui</i> .	
Help Received Our math teacher, Mr. McAusland, checked our calculations for accuracy. A high school chemistry teacher, Mark Regan, answered our questions about aluminum. Our moms helped us take pictures, cut papers for our board and proofread our report.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Xena L. Senn	Project Number J2319
Project Title Does pH Affect Glyphosate Performance?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine if lowering the pH of the mix water to a pH of 5 would decrease the performance of Glyphosate on Bermuda grass.</p> <p>Methods/Materials Take a Glyphosate sample mixed with water with a pH value of 5 or pH of 9 and apply both herbicide samples to 10" by 10" squares of Bermuda grass. Each pH value was tested 35 times. After a 2 day and 7 day interval, the Bermuda squares were measured with a measurement grid and performance recorded in percent.</p> <p>Results Glyphosate mixed with water with a pH of 5 did not perform as well as the Glyphosate mixed with water with a pH of 9 when measured at both the 2 day and 7 day intervals.</p> <p>Conclusions/Discussion My conclusion is that pH does affect Glyphosate performance and that Glyphosate mixed with water with a pH of 5 had a decrease in its performance.</p>	
Summary Statement Determining if lowering the pH value of the water mixed with Glyphosate would affect its performance.	
Help Received Mother helped type report and glued title on project board. Father supervised the safe handling and application of Glyphosate.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Kaytlin R. Sexauer	Project Number J2320
Project Title Will Radish Seeds Germinate Better in Non-contaminated or Contaminated Ashes?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to see if radish seeds will germinate in non-contaminated or contaminated ashes. I believe that the radish seeds will germinate better in Eucalyptus ashes as opposed to Cedar or Plum ashes. I also believe that the radish seeds growing in the used motor oil contaminated ashes will have a higher germination rate when compared to oil base paint and the control group.</p> <p>Methods/Materials First, I gathered 3 types of wood: Plum, Cedar and Eucalyptus. Next, I separated each type of wood into 3 equal piles and put 1 pile of each type of wood into a 5 gallon bucket and another pile of each type of wood into another 5 gallon bucket. I then poured used motor oil over the wood in the 1st bucket and oil base paint over the wood in the 2nd bucket. I burned all the wood making sure to clean out the fireplace and or firepit before burning the next type of wood. Next I laid 2 layers of cotton squares down into 3 plastic trays and laid ashes on top of it. The separated by contaminate so no cross contamination would occur. I then planted the radish seeds 7 down and 3 across. I measured the germination rate every 5 days for 20 days and made sure the cotton stayed moist.</p> <p>Results The radish seeds germinating in the Cedar ashes had the highest germination rate in oil base paint and used motor oil when compared to eucalyptus and plum. The radish seeds that had the lowest germination rate was the seeds growing in the eucalyptus which didn't germinate any seeds at all. The contaminate that had the highest germination rate was oil base paint and the lowest was the control group which also did not germinate any seeds.</p> <p>Conclusions/Discussion My conclusion is the radish seeds germinating in the oil base paint contaminated ashes had the highest germination rate. The type of wood containing the most germinated seeds was Cedar.</p>	
Summary Statement My project was to observe the germination rate of radish seeds growing in different non-contaminated and contaminated ashes.	
Help Received Father helped by burning the different types of wood. He also helped with handling of contaminates and their disposal.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Alexandra D. Singer	Project Number J2321
Project Title How Do Increased Carbon Dioxide Levels Affect Plant Growth?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I am concerned about global warming and its impact on the environment. Carbon dioxide is one of the greenhouse gases that is increasing in concentration in the world's atmosphere due to the human action of burning fossil fuels. The purpose of my experiment was to find out how increased carbon dioxide levels affect plant growth.</p> <p>Methods/Materials I conducted this experiment using two sets of plants. Each set had the same glass jar, plant type, amount of soil, and amount of water. For each set of plants, one of the plants was in a sealed glass jar with air and the other was in a sealed glass jar with increased carbon dioxide levels. Plant height was measured every few days for approximately three weeks.</p> <p>Results My experiment results were that increased carbon dioxide levels had a negative effect on plant growth. In other words, the plants in the jars with high levels of carbon dioxide did not grow as well as the plants in the jars with regular air.</p> <p>Conclusions/Discussion My hypothesis was that I expected higher carbon dioxide levels to help plant growth but my experiment showed the opposite, that higher carbon dioxide levels actually hurt plant growth. I believe higher carbon dioxide levels have a positive and a negative effect on plant growth. The positive part is that plants need carbon dioxide to make their food. On the negative side, carbon dioxide particles reflect sunlight and so less sunlight reaches the plant. Plants need sunlight to make their food and so by blocking sunlight, carbon dioxide hurts plant growth. I have concluded that carbon dioxide hurts plants. However, my experiment is one that many scientists who are concerned about global warming have studied with uncertain and conflicting results.</p>	
Summary Statement This study will try to determine how increased carbon dioxide levels affect plant growth.	
Help Received My parents helped me use a glue gun for the model and display.	



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Esmeralda Velasquez	Project Number J2322
Project Title What Effect Does pH Have on Snail Reproduction?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was about the effect of pH on aquatic snail reproduction. I wanted to study a project in the zoology category because I like studying the life of animals and what affects them, in this case the effect of pH on snail reproduction. I hypothesized that the base bowl would lay more eggs due to the calcium content of the shells and the alkalinity of the base solution compared to the high acidity of the vinegar solution.</p> <p>Methods/Materials I used 10% vinegar solution as the acid variable and 10% sodium bicarbonate solution as the base variable. The solutions were added to the snail bowls in increments to establish acidity/alkalinity. I also had a control bowl in which no solution was added. The responding variable was snail eggs laid per day. Additional supportive data was taken on snail weight, pH levels of bowls, and egg loss (non-viable egg count).</p> <p>Results Snails in the acidic solution laid a minimum of .89 eggs and the basic solution laid 1.4 eggs on average per day while the control was 1.78 eggs on average per day. Weight data shows the average of the control increased by 5% while the basic bowl lost 4.51% of their weight, and the acidic bowl lost 5.68% of their weight. The pH level for the acidic bowl did not go below 5.0 and the basic level did not go above 8.</p> <p>Conclusions/Discussion My hypothesis was right. I believe that average data showed the acidic snails laid less eggs because the vinegar was disintegrating the snail shells. In their quest to repair their shells in order to survive, they were not able to lay as many eggs. Snail shells are composed of calcium deposits which are very susceptible to acidic damage. The damage was enough to cause stress to the snail and slow down the reproductive process.</p>	
Summary Statement The level of pH affects snail reproduction.	
Help Received Teacher as facilitator	