



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Rebecca C. Almader	Project Number J2001
Project Title The Mystery Behind Painkillers: Determining the Adverse Effects of Over-the-Counter Anti-inflammatories on Stomach Acid	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to investigate if the traditional over-the-counter painkillers affect the stomach acid and health of an individual in the future. Over-the-counter painkillers serve many purposes throughout one's daily life, causing overusage. Due to the fact that the artificial stomach acid took longer each time to dissolve the pill, the chemicals in the pill will affect the acid in a negative way. The pills diluted the stomach acid causing the acid to decrease in acidification levels. Even if advertisements say that the pills are beneficial, the secret behind the pills is shown in this project.</p> <p>Methods/Materials First, research was done to investigate the main chemicals in an average human stomach. The next step of this project was to create an artificial stomach out of hydrochloric acid, water, table salt, and potassium chloride. These materials were measured to an exact rate using teaspoons and tablespoons and placed in four different glass jars. Then, each different type of pill out of Aleve, Advil, Aspirin and Tylenol was placed in the jars. A timer was used to track how long each pill took to dissolve and a document was used to track the times given. The dosage of each jar was kept at a constant rate when it was added each time. This was tested seven times, one test for each day of the week.</p> <p>Results After investigating the results, the stomach acid had a harder time to dissolve a pill after the first test. This is because of the chemical build up from the pills affected the stomach acid in a negative way causing the hydrochloric acid to dilute making the time to increase. The pills with the powder texture dissolved faster than the pills that were gel caps. This is because the acid had to enter the interior of the gel caps while the powder texture pills have a very thin layer.</p> <p>Conclusions/Discussion Painkillers are not as good as one might think. The pill might decrease pain and problems in your body but can lead to more severe problems. The chances are that the over-the-counter pills dilute one's stomach acid creating the stomach to have less hydrochloric acid. Hydrochloric acid is the main acid in an average human stomach and it is there to help process food that enters the body. The leading advertisements do not always say what the long term side effects and according to this project, over-the-counter pills may cause digestion problems and much more.</p>	
Summary Statement As measured by time, I was able to prove that over-the-counter painkilling pills can lead to severe problems in the future based on the dilution of stomach acids.	
Help Received In order to be succesful for the science fair of 2017, I had my science fair teacher explain to me the chemical reactions that occur when a pill has contact to the human stomach acid. I also had a proffessional contact from the local hospital explain to me what she reccomends her patience to take whe is comes to	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Reece V. Borrman	Project Number J2002
Project Title Prolong the Produce	
Abstract Objectives/Goals My goal was to find the best environment to keep produce that usually goes bad quickly edible for long periods of time to save money, stop food waste, and help families use the food they paid for. Methods/Materials The materials I needed were some raspberries, blueberries, strawberries, green onions, mushrooms, cilantro, and beansprouts, 9 large Tupperware containers, 9 small air tight containers with twelve sections, a refrigerator, supplies to clean and dry produce (desiccant packages-hygrometers and thermometers, paper towels). Results Room temperature environments were least effective while cold and dry environments kept fruit the best. Warm and wet environments kept vegetables the longest. Dry and 2.7 degrees Celsius kept the white mushrooms the longest. Conclusions/Discussion It was a different environment to keep the produce the best but the dryness didn't let the fruits go mushy and kept them in shape, while the wetness let the vegetables stay hydrated, transpire, and respire. The coldness of the refrigerator slowed down the activity of any bad bacteria and bad microorganisms that speed up the process of mold.	
Summary Statement I found ways to store produce longer, so I could help make the world a better place.	
Help Received I desinged the experieмент myself, my parents helped purchase my materials and Mrs. Shimshock reviewed my board.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Joshua L. Brison	Project Number J2003
Project Title Terpenes vs. Mold	
Abstract Objectives/Goals I started doing research on the bark beetle when I found out about the blue stain fungus. Then my father asked me what stops the blue stain fungus? The answer was terpenes. In a natural forest terpenes kill the fungus. This led me to the question is terpene more powerful than household mold killers? My goal was to try to see if we could use the results to benefit the trees. Methods/Materials I took nine mold killers and compared them to 100% pure terpene to see which chemical is the better mold killer. We took 10 petri dishes full of agar and mold then we let the mold grow for at least two weeks when the mold was covering the whole dish, I added the chemicals and observed the death. I found the area of the dish then subtracted the area of the dead mold. Results The result was that 100% turpentine was the most powerful mold killer. When the turpentine came in contact with the mold, death was immediate in the area where it was dropped and in a slight radius around it. In a period of 24 hours the death spread to the entire dish more effectively than any other mold killer we tested. Conclusions/Discussion In all six trials the results were conclusive and consistent. The results supported my Hypothesis that the trees natural defenses would beat the other products. The experiment help show me that the trees natural defenses are highly adapted at killing mold. All of this research has given me greater understanding of the war between the bark beetle and the pine tree.	
Summary Statement I compared terpenes, the pine tree's natural defenses against bark beetles and blue stain fungus, to household products to see which is the most effective at killing molds and fungus.	
Help Received Terry Hampton my science teacher, Chris Fuller my mentor teacher, Maryanne Garamendi our science fair coordinator, Corrie Ross my teacher, Susan Kocher with the Forest Service talked with me by phone about the forest, Dr. Wood Head of Entomology at UC Berkeley spoke with my by phone about bark	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Alyssa P. Cerda	Project Number J2004
Project Title Analyzing the Effects of Sulfates on Hair Tensile Strength	
Abstract Objectives/Goals The objective of this study is to determine if sulfate free shampoos versus sulfate containing shampoos affect hair tensile strength in different ways. Methods/Materials I will be using human hair strengths, four different shampoos (2 containing sulfates, 2 containing no sulfates), plastic bags, rice to pour into bags taped to end of individual shampoo treated hair strands, duct tape, ring stand, digital scale (measured in grams). I will test each type of treated hair strand by taping a plastic bag to the end of the strand, then taping the other end of the strand to the ring stand. I will slowly pour grains of uncooked rice into the plastic bag until the hair strand breaks. Then I will measure how much rice the hair held in the bag on the digital scale. Results The sulfate-free shampoo had the worst effect on hair. When compared to the control group (no shampoo at all), the best Sulfate shampoo average had a difference of 5.12 grams. The best sulfate-free shampoo average had a difference of 10.82 from the control group. The sulfate-free shampoos held an average of 75.5 grams. The sulfate shampoos held an average of 60.7 grams. The hair treated with only water (control group) held an average of 60.7 grams. Conclusions/Discussion In conclusion, people who purchase sulfate-free shampoo should be cautious of what kind they get, because sulfate-free shampoos I tested demonstrated lowering the hair tensile strength. The sulfate-free shampoo had the worst results in strength, which means that sulfate-free shampoo may do some damage to your hair strength. The sulfate containing shampoo showed a higher tensile strength.	
Summary Statement My experiment showed that certain sulfate containing shampoos showed to overall improve hair tensile strength over a control group and sulfate-free shampoos.	
Help Received Jewely Lickey, Sanger Academy Charter School Science Teacher	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Audrey D. Fuelle	Project Number J2005
Project Title Can Mouthwash Kill Germs Better When Compared to Toothpaste?	
Abstract Objectives/Goals The objective of this study is to better understand and improve simple oral health challenges we face daily regarding the products we use. Methods/Materials Colgate Total mouthwash, Colgate toothpaste, approximately 40-50 agar plates (ordered from amazon.com), 36-40 swabs,sterilized gloves, camera/ lab journal (preferably of graph composition) Results In my previous experiment I concluded that, when used independently, mouthwash is more effctive at killing germs when compared to toohtpaste for mouthwash presented colonies of coral pigment which can infered as more exotic and immune bacteria. The samples from using toothpaste presented more fungi that grew rapidly. Yet both products used together resulted in less colonies that grew at a slower pace. Conclusions/Discussion Mouthwash is scientifically better because it contains cetylpyridinium chloride; an antiseptic that provides for 12 hours of antibacterial protection. These results have a P value of approximately 25%. This investigation can provide more reassurance for our daily oral health routine, but because the P value is so high I would have to recreate my experiment in order to obtain more accurate/credible data. This will then lead to a more conclusive analysis and conclusion statement. A redefined experiment will be achieved by increasing the sample size and doing before/after samples for each trail.	
Summary Statement As measured by the outcome of the oral samples in agar plates, I found that mouthwash used independently kills more germs when compared to using toothpaste in the same conditions.	
Help Received My science teacher, Dr. E. Dunkle, helped me redefine my experimental procedure to recieve the most accurate data and she helped me analysis some of my results.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Heather Anne George	Project Number J2006
Project Title Is Your Dog Food Safe?	
Objectives/Goals The purpose of this science experiment was to determine if there were harmful bacteria in popular brands of dry, canned, and wet dog food. If dry, canned, and wet dog food are tested for bacterial colony growth, then the dry dog food will show the greatest bacterial colony growth.	
Abstract Methods/Materials Three trials of the following steps were completed. Two pre-prepared nutrient agar petri dishes were inoculated with each brand and type of dog food. The petri dishes were observed for bacterial colonies every other day for 11 days. At the end of 11 days, the average number of bacterial colonies in each petri dish in each group were calculated and compared. Materials included dry, canned, and wet dog foods; nutrient agar petri dishes with lids, gloves, and sterile swabs.	
Results In the dry dog foods, Natural Balance had more colonies than the others in all three trials. Natural Balance had a range of 6.5 to 22 colonies in the three trials. In the canned dog foods, Royal Canin had the most colonies in Trials 2 and 3. Royal Canin had a range of 0.5 to 22.5 colonies. In the wet dog foods, Nature's Recipe and Royal Canin had the most colonies. Nature's Recipe had a range of 1.0 to 3.5 colonies and Royal Canin had a range of 0.0 to 12.5 colonies.	
Conclusions/Discussion When the dry, canned, and wet dog foods were tested for numbers of colonies, one brand of food in each group had more colonies. Contaminated dog foods could be responsible for some dogs digestive tract diseases causing serious health threats. This study confirms some commercially prepared dog foods contain bacterial colonies. Additional studies need to be done including more brands of dog food and testing more samples from each brand.	
Summary Statement Dry, canned, and wet dog foods were tested for bacterial colony growth.	
Help Received Mr. John Briner encouraged me to include more types of dog food as well as helped me bleach and dispose of contaminated agar plates.	



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

Name(s) Liana Hernandez	Project Number J2007
Project Title The Skinny on Moisturizers	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to determine which moisturizer performs the best in keeping skin moist.</p> <p>Methods/Materials I tested 5 different moisturizers three times each in order to obtain accurate data for my experiment. Using a Jell-O skin mold contained in a petri dish, I equally distributed each different moisturizer on top of the Jell-O mold. I also left 3 petri dishes with just Jell-O only to use as my controls. I made sure to label each dish so that it is easily identifiable when collecting my data. Each petri dish contained the same amount of Jell-O and the same amount of moisturizer. I then measured and weighed all eighteen petri dishes every day for two weeks. I did this so that I would be able to track their loss of water over the two week period. When the two weeks were complete, I collected all my data so that I could calculate the amount of water retained in each petri dish.</p> <p>Results Based on my results, you can clearly conclude that Vaseline and Aquafor Healing Ointment both lost the least amount of weight during the experiment. Aveeno Hand Repair Cream came in third with 80% of its weight being retained. For height loss, both Aveeno Hand Repair Cream and Aquafor Healing Ointment lost the least amount of height. Vaseline came in third with 73% of height retained. I hypothesized that Aveeno Hand Repair Cream would be the moisturizer that would perform the best. According to my results, that hypothesis is incorrect.</p> <p>Conclusions/Discussion Even though my hypothesis was incorrect, I can conclude that people would more likely want to use the Aveeno Hand Repair Cream over Vaseline and Aquafor Healing Ointment. Based upon my interview with Dr. Hsu, Assistant Chief of Dermatology at Kaiser Medical Center, he states that people would not necessarily pick Vaseline and Aquafor Healing Ointment for everyday use due to the consistency and texture that it would create on the skin. He further states that the Aveeno Hand Repair Cream would be the most comfortable on human skin for everyday use. It would also be the top recommended choice due to the fact that patients prefer a cream over a thick, greasy, jelly-like substance. In conclusion, even though Vaseline and Aquafor Healing Ointment performed the best, the Aveeno Hand Repair Cream would be the most practical choice for consumers looking for a good moisturizer.</p>	
Summary Statement I was able to determine how well different ingredients in skin products work at keeping the skin moist by using a jello mold to model human skin.	
Help Received Dr. Phillip Hsu, Assistant Chief of Dermatology, Kaiser Permanente Fontana, CA allowed me to interview him on the different types of moisturizers on the market, and how their ingredients determine their effectiveness in keeping skin moist.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Elise M. Hoffman	Project Number J2008
Project Title Oxidation of Mercaptans: The Power to Remove Skunk Odor	
Abstract Objectives/Goals The objective of this study is to determine which remedy would work best on skunk spray (n-Butyl mercaptan) to remove it's odor from fur. Methods/Materials Synthetic fur was tested to determine the ability of agents to remove skunk odor. Three sets of five pieces of fur were sprayed with n-Butyl mercaptan (synthetic skunk odor). After allowing for dry time, the fur pieces were then soaked in different solutions: A mixture of baking soda, dish soap and hydrogen peroxide (a treatment recommended by the ASPCA, The American Society for the Prevention of Cruelty to Animals); tomato paste with water; Vinegar; and Nature's Miracle Skunk Odor Remover. One fur piece was left untreated as a control. The fur pieces were then rinsed with water and tested in a blind sniff test by volunteers who ranked the remaining odor strength of the n-Butyl-mercaptan (skunk odor) on a scale of 1 to 10. Results Three trials were performed several hours apart, with each trial having the same five participants. Each participant smelled a fur piece and ranked the odor on a scale of 1-10, with 1 being the best and 10 being the worst. In between each ranking, the participants cleared their noses by smelling coffee beans. Participants could resample a fur piece during a trial if they requested and adjust their scores based on the experience with other fur pieces. Once three trials were completed, the results were averaged for each fur piece to determine which solution performed the best. Conclusions/Discussion Tomato paste had little to no effect on the skunk odor. Nature's Miracle Skunk Odor Remover was the most effective in removing the odor. We believe this is due to the solution's increased oxidizing capabilities (Oxygen accelerator), as this was the only real difference between it and the Baking soda, dish soap and Hydrogen peroxide solution.	
Summary Statement I showed that the remedy with the most oxidation potential was the most effective at removing n-butyl mercaptan	
Help Received I received help from 5 volunteers who smelled the treated fur samples. (Jean Preston, Sandy Fortin, Jennifer Hoffman, Scott Hoffman and Collin Hoffman). My father, Scott Hoffman, a Chemical Engineer, helped to explain oxidation chemistry as it relates to sulfide bonds.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Hala Javeed	Project Number J2009
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Project Title
Does Chemical Lightening Affect the Structure of Human Hair?

Abstract

Objectives/Goals
The objective of my study was to determine if chemically lightening human hair affected its structure, based on how it reacted to humidity.

Methods/Materials
hygrometer, hydrogen peroxide developer in 10, 20, and 30 volume, bleach, swatches of chemically untreated human hair
The hydrogen peroxide developer and bleach powder were obtained from my teacher's friend since he works at RedKen. Mixed a 1:1 mixture of hydrogen peroxide developer (in all 3 volumes) and bleach powder. Dyed all samples 1 for the each volume of the peroxide and left the dye on for intervals of 10,20, or 30 minutes. I built 4 hygrometers, and then placed a strand of the dyed hair on a hygrometer. Placed the hygrometers in bathroom while shower was on hot setting for 10 minutes. Repeated for a total of 30 trials, 3 trials for each differently treated, sample of hair.Measured the expansion of hair, in millimeters and compared results.

Results
My data shows that the hair sample H9, (treated for 30 minutes and with hydrogen peroxide developer of 30 volume) expanded 7mm in the first and second trial, and 6.5mm in the third trial. This is the most expansion seen compared to other samples. Since the hair shaft shifted causing it to expand, this means dyeing your hair does weaken its structure. The other samples expanded less because they were not exposed to the dye that long and were treated with smaller volumes of developer.

Conclusions/Discussion
I thought that hair sample H9 would expand the most is because I thought chemically lightening hair would have a big impact on the strength of it. After I did research, I found this to be true. The hydrogen peroxide in the hair dye increases the number of hydrogen ions in the solution, which breaks down the outermost layer of your hair, the cuticle layer, and lipids. One#s hair is already weak by dyeing it, but what does humidity do? Hydrogen bonds in one#s hair form water molecules between keratin in your hair. This is why sample H9 resulted in a longer expansion size in all three trials.

Now that people know that dyeing your hair weakens it, you can lessen the frequency of dyeing your hair or choose not to do it at all. Also, you can use natural alternatives such as lemon based lighteners, or henna dye. People who have dyed their hair can use keratin treatments to close their hair cells and make them stronger while still dyeing regularly.

Summary Statement
In my experiment, I proved that chemically lightening human hair affected and weakened its structure, based on how the hair strand reacted to humidity.

Help Received
Mrs. Wolfe (my advisor) led me to Mr. O#Donnell, a chemist who specializes in hair and chemical lightening. He works at RedKen and without him I could not have successfully dyed all my hair swatches and obtained materials like hydrogen peroxide based developer in such large and specific quantities.



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Hannah J. Little	Project Number J2010
Project Title Bedding Bonanza	
Abstract Objectives/Goals The goal of this project is to determine which horse bedding is most absorbent. Methods/Materials Containers, four bedding types, measuring cup, strainer, timer. Poured water into container with bedding and let it sit for five minutes. Then measured excess water. Results The three most successful bedding types absorbed at least half the water. One bedding did not absorb any water. Conclusions/Discussion Dry Stall is the most absorbent bedding. This information is helpful to me and the horse community because we can select the best bedding during the rainy season.	
Summary Statement I showed that the horse bedding Dry Stall is the most water absorbent.	
Help Received I designed the project and executed it with the help of a friend.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Annalisa J. More	Project Number J2011
Project Title Comparison of the Nutritional Value of Infant Formulas Using a Handheld Refractometer	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Background: Infant formulas are designed to provide complete nutrition for babies. There are numerous types of infant formulas that vary based on type of protein (milk, soy, hydrolyzed, amino acid), liquid versus powder, and brand name versus generic. Objective: I sought to determine which kind of infant formula has the greatest nutritional content by measuring the amount of dissolved solids using a handheld refractometer.</p> <p>Methods/Materials Methods: Infant formulas were prepared according to manufacturer's instructions. Using a handheld refractometer, light refraction through various infant formulas was measured, which correlates with the amount of dissolved solids present in the infant formulas. Whole fat cow's milk (liquid) was chosen as a positive control. Distilled water was used as a negative control, as a diluent for powdered infant formulas, as well as to calibrate the refractometer. Readings were performed in duplicate and an average value obtained.</p> <p>Results Results: The value ranged from 5.35 to 13.15. Kirkland Signature (powdered generic milk protein) had the lowest percent Brix reading (5.35), while Nutramigen (liquid hydrolyzed milk protein) had the highest percent Brix (13.15). In general, liquid formulations had higher percent Brix readings than powdered formulations. Some generic infant formulas had significantly lower percent Brix than brand name infant formulas, while other generic infant formulas were nearly identical to brand name formulas.</p> <p>Conclusions/Discussion Conclusions: . The Nutramigen (hydrolyzed milk protein) infant formula had the greatest nutritional content, possibly because the partially broken down proteins present in this formula are still large enough to refract light, and are more numerous than that of the whole milk or soy protein. Neocate (amino acid) had the lowest nutritional content. Powdered formulas that required reconstitution had, in general, lower nutritional content than liquid formulas. Finally, generic infant formulas had similar nutritional content compared to generic formulas, except for Kirkland Signature (generic powdered milk protein), which had an extremely poor nutritional content as a result of being poorly soluble in water. Parents should be aware that infant formulas are not created equal and vary widely in nutritional content.</p>	
Summary Statement My project is about which infant formula has the greatest nutritional value.	
Help Received My father who is a professor explained and helped me design and perform my experiments. H donated materials needed. He also acted as my scientific adviser	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Mana Sadeghi	Project Number J2012
Project Title Zap That Zit: Which Acne Medication Can Efficiently Clear Your Acne?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to find the most effective treatment against acne. In my hypothesis I stated, if I use acne treatments with either benzoyl peroxide, salicylic acid, or natural ingredients (like charcoal), then the bacteria [E. coli] should be cleared evenly since each product should be equally effective against the bacterium. The question I asked was which affordable acne medication can efficiently clear acne.</p> <p>Methods/Materials To conduct this experiment I used the Kirby-Bauer disk-diffusion method, in which disks are soaked with an acne medication, then placed on an E.coli enriched agar plate. I then checked the zone of inhibition, or the area around the disk where the bacterial growth was inhibited or stopped, after 12, 24, and 36 hours of incubation. In this experiment I originally used the acne medications PanOxyl, OXY, AcneFree, Neutrogena, Up & Up, Clean & Clear, Biore, Burt's Bees, and YesTo, along with agar plates, sterile glass rods, medicine droppers, forceps, gloves, urine cups, an autoclave, paper towels, water, and the E. coli bacterium. Later, the acne treatment SkinMedica was added into my project. All the products used fall into three categories based off of active ingredients: Salicylic acid, benzoyl peroxide, and naturally sourced ingredients.</p> <p>Results After six trials and incubation periods of 12, 24, and 36 hours, I learned that the acne product SkinMedica is the most effective treatment with an average zone of 4.83mm at 12 hours, 5.67mm at 24 hours, and 7.5mm at 36 hours. The second most effective product is Clean & Clear, followed by Up & Up. The least effective products were PanOxyl and OXY, both of which had an average zone of 0mm at 12 and 24 hours, and 0.5mm at 36 hours. Overall the salicylic acid treatments on average work the most effectively, followed by the naturally sourced products, then the benzoyl peroxide products.</p> <p>Conclusions/Discussion In conclusion, I learned that the acne washes made with salicylic acid on average work the most effectively against acne, and the benzoyl peroxide do not. I proved that SkinMedica is an effective agent against acne and that the agent benzoyl peroxide is not very effective in wash form, but may be more effective in a cream or lotion form. After adding a cost analysis per ounce to my project, I found that price has no correlation with the effectiveness of the product.</p>	
Summary Statement In this project I tested different affordable acne medications against the bacterium E.coli in order to find the most efficient treatment available, and reached my conclusion through the use of the Kirby-Bauer disk-diffusion method.	
Help Received I designed and performed all of the experiment myself, however my advisor aided me with grammatical errors in my writing	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Samantha B. Salazar	Project Number J2013
Project Title How Does Fruit Preservation Help Consumers?	
Abstract Objectives/Goals The objective of this investigation is to determine which method of preserving fruits is the best, so consumers won't have to waste money and throw away unnecessary food. Methods/Materials I used apples, strawberries, and blackberries, washed and put them into either, bowls, or Ziplock bags. I then placed those on the counter, in the refrigerator, or in the freezer. Using the fruit in Ziplock bags and bowls on the counter as a control, I checked on the fruit daily comparing its decomposition rate to that of the fruit in Ziplock bags and bowls in the refrigerator, and in the freezer. Results After completing my investigation and comparing the results on what the fruits were stored in and where they were stored, I found that the fruits in bowls and bags in the fridge lasted longer than the fruits in bowls and bags in the freezer and on the counter. Conclusions/Discussion After conducting multiple trials, it was found that fruits in bowls and bags in the fridge lasted longer than the fruits in bowls and bags in the freezer and on the counter. This can hopefully provide me with the knowledge to get the most out of the food I buy.	
Summary Statement As measured by the time it took different fruit to spoil when stored in bowl, and Ziplock bags, in three different locations, I was able to determine the most affective storage method for fruit preservation.	
Help Received I designed and conducted my investigation with minimal help from my teachers (Mr. Nelson and Mrs. Lickey) and parents.	



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

Name(s) Cadence Mary Terese R. Saniel	Project Number J2014
Project Title The Anti-Oxidant Army	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective and goal of my experiment is to see which ant-oxidant will prevent an apple from turning brown the longest. I want to see which anti-oxidants are effective in reducing oxidation and can prevent harmful diseases from spreading. They do this by neutralizing free radicals, which are the cause of many of these diseases that we see today.</p> <p>Methods/Materials I used 6 different anti-oxidant extracts from Acai berries, blackberries, pomegranate, green tea, dark chocolate and kale. The anti-oxidants were mixed into cups with room temperature water, and sliced apples were placed into the cups, along with a controlled variable tested with only plain water. I observed them daily and noted any changes in color. The experiment was repeated for a total of 3 trials.</p> <p>Results The results of my experiment showed that the Acai and Pomegranate are the most effective anti-oxidant because it starts to turn brown slowly, and showed less discoloration in the end. The dark chocolate result is similar to the berries, while the green tea proved to be the worst, as it completely turned brown on the second day of my experiment. The black berry showed a very slow change, but in end, it showed a higher amount of browning after 7 days. Kale's result shows that it can minimize the amount of browning in the end.</p> <p>Conclusions/Discussion I chose blackberry as my hypothesis and this experiment showed that I am incorrect, because among all the different variables that I used in this experiment, I found the berries, particularly the Acai and Pomegranate, to be the highly effective in preventing oxidation of free radicals. They are listed among the highest ORAC (Oxygen Radical Absorbent Value), a method used to measure oxidative capacities of biological sample established by the US Department of Agriculture. With their anti-oxidant properties and their large number of vitamin and mineral content, the berries are very effective to fight free radicals that causes a lot of diseases today. This experiment also shows that while some of the variables, like green tea, may not be as good in preventing the apple's skin of turning brown, they have different forms of flavonoids that can function to absorb large number of oxygen, an effective way to fight against free radicals. I was also able to understand the reason why dark chocolate's result is the same with the berries, and it is because their anti-oxidant property is also found in Acai oils.</p>	
Summary Statement I tested 6 different anti-oxidants to determine which one will prevent an apple from turning brown, and I found out that the berries are very effective in fighting free radicals.	
Help Received My science teacher suggested to use water as my controlled variable, while my mom suggested some tips in designing my project board.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Jalen P. Vuong	Project Number J2015
Project Title The Germinator	
Abstract Objectives/Goals For my science fair project I tested three household objects (TV remote, house phone and game controller) first with hand sanitizer and a week later with antibacterial soap to see which one would kill the most germs/bacteria. Methods/Materials Nine petri dishes filled half way with agar, labels, culture swabs, antibacterial soap (EO Products), hand sanitizer (EO Products), tap water, scotch tape, metric ruler, plastic gloves, cardboard box. Results My results showed that during a two week observation for each cleansing method (antibacterial soap and hand sanitizer) the germs and bacteria were eliminated the most with the hand sanitizer. The antibacterial soap had six times more bacteria colonies than the hand sanitizer. Conclusions/Discussion My conclusion proved my hypothesis to be incorrect. The antibacterial soap did not kill the most bacteria. Due to the fact, that I was testing the cleansing of objects instead of hands, my experiment showed less germs/bacteria growth with hand sanitizer than the antibacterial soap and water. I believe this was the case because the hand sanitizer stated it contained sugar cane alcohol, making it 99.9% effective against common germs and bacteria. The antibacterial soap was only rubbed three times in a back and forth motion and not the recommend twenty seconds in warm water needed to eliminated most of the germs and bacteria.	
Summary Statement I conducted tests that showed hand sanitizers are more effective in killing germs and bacteria than antibacterial soap.	
Help Received None. I organized, designed, and performed the experiments myself.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Elisa M. Win	Project Number J2016
Project Title Death Rays: Testing the Effectiveness of Different Sunscreen SPF's at Different UV Time Exposures	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this study is to determine the effective ability of different sunscreen SPF's under different ultraviolet light time exposures.</p> <p>Methods/Materials Sunscreens with SPF 30, 45, 100, E. Coli bacteria, agar plates, 97 degrees Fahrenheit incubator. Tested the effectiveness of sunscreen SPF's by applying sunscreen on agar plates. Applied 2 microliters of the bacterial solution on the agar plates. Agar plates were placed under the UV source for a certain amount of time and were placed in an incubator.</p> <p>Results The number of bacterial colonies that grew was counted to determine the effectiveness of different sunscreen SPF's at different UV time exposures. Several trials were conducted for accurate results. The greater the number of bacterial colonies, the more effective the sunscreen SPF was. SPF 30 was best able to protect the bacteria from the UV source at a UV time exposure of 30 minutes because SPF 30 had the largest number of bacterial colonies.</p> <p>Conclusions/Discussion SPF 30 was most effective in protecting the bacteria from the UV source at a UV time exposure of 30 minutes. It is concluded that consumers should use a sunscreen with SPF 30 to protect themselves from the sun's harmful UV rays in order to prevent unnecessary health issues such as skin cancer from occurring.</p>	
Summary Statement I showed that a sunscreen with SPF 30 is more effective in protecting bacteria than a sunscreen with SPF 100.	
Help Received I performed the experiments myself. My Science teacher provided supervision during the experimentation process and reviewed my results.	



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Tanishq Bhatnagar	Project Number J2099
Project Title Caffeine Overdose in Energy Drinks	
Abstract Objectives/Goals This project is a result of the alarming number of emergency room visits by young adults consuming energy drinks. Most energy drink manufacturers claim that these drinks are as #safe# as coffee. The purpose of this project was to find out if energy drinks increase heart rate of people more than coffee does, and also determine which energy drink among the three popular ones, Red Bull, Monster Energy, and 5-hour Energy increases heart rate the most. Methods/Materials Materials: Red Bull, Monster Energy, 5-hour Energy, Daphnia magna, Starbucks pike place coffee, Petri dishes, eyedroppers, beakers, slides, microscope. Method: I decided to use Daphnia magna as my test subject. I first recorded the heart rate of Daphnia in distilled water (1st control group) and then in different concentrations of Pike Place Starbucks coffee (2nd control group). I then exposed Daphnia to different concentrations of the three energy drinks and recorded their heart rate and compared it to the two control groups. Results The heart rate of Daphnia exposed to Red Bull increased by 0%-14%. Daphnia exposed to Monster energy drink showed an increased heart rate of 3% - 15%, and Daphnia exposed to 5-Hour Energy showed an increased heart rate of 6% - 25%. All energy drinks did increase heart rate of Daphnia. Conclusions/Discussion All the energy drinks chosen for the experiment did increase the heart rate of Daphnia magna. The rate of increase however, was not the same for similar concentration of the different energy drinks chosen for the experiment. Analyzing my results I concluded that Red Bull had no significant effect on the heart rate of Daphnia and could be the safest energy drink of the three energy drinks tested, Monster energy drink may increase heart rate to some extent and may be harmful, and 5-hour Energy will significantly increase heart rate and may be quite detrimental as research shows that 10 to 22 additional beats per minute, i.e a 14% - 25% increase in human resting heart rate, raises the likelihood of death by 16%.	
Summary Statement The purpose of the project is to highlight the harmful effects of energy drinks especially on teens and young adults who are using these drinks to cope with mental and physical stress.	
Help Received My teacher, Ms. Anu Toutem helped me order the Daphnia and my sister helped me with the project.	