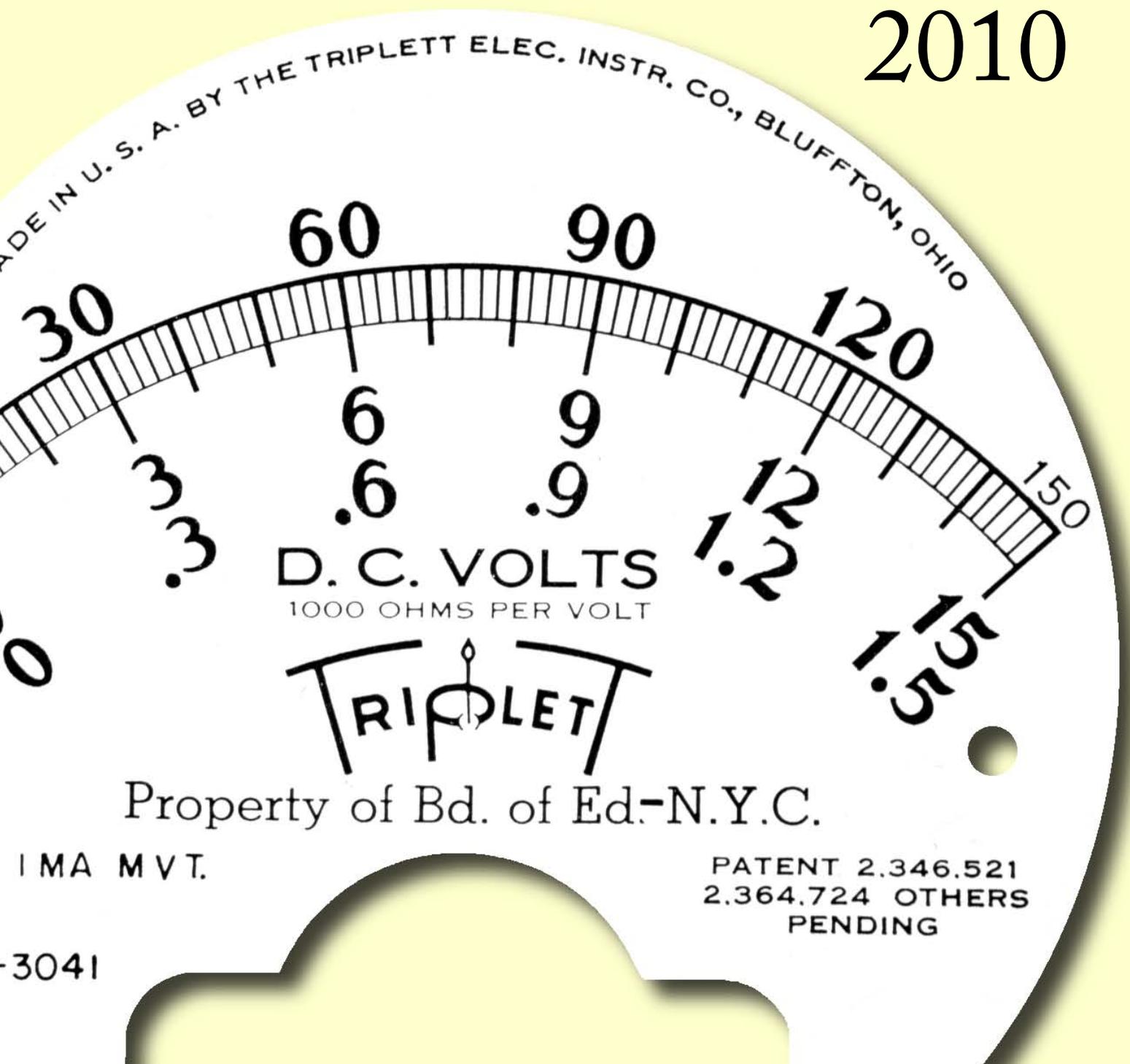


Midwood High School Research Program Science Fair 2010





2010 Midwood High School Science Fair

27 May 2010 — 3:30 to 5:30 PM

David Cohen — Principal
Michael McDonnell — Assistant Principal
Tovia Rosenfeld — Assistant Principal
Glenn Elert — Research Coordinator
Jennifer Sullivan — Research Teacher
Jessica Ross — Research Teacher
Denise Aubrey — Research Teacher

Timeline

Period 4, 5, 8, 9

Tutoring in room A214 (Research Room) is cancelled
Sophomores park boards in A214 (Research Room) during assigned class time
Sophomores deliver snacks, drinks, plates, etc. to room A300 (AP's Office)

1:40 PM (Period 9)

Junior and Senior judges congregate in library
Junior and Senior tasks are explained
Junior and Senior judging packets distributed (time to read abstracts)

2:30 PM (Period 10)

Regularly scheduled classes in room A318 & A320 moved to main building
Junior and Senior judges perform assigned tasks
Rooms inspected
Judges use assignment packet as ticket for snacks in room A313 (Physics Lab)

3:20 PM (Period 11)

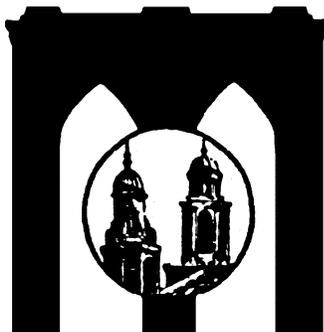
Teacher and alumni judges drift in and are given judging packets
Sophomores move to assigned rooms, boards already in position
Sophomores given time to make adjustments to boards and self
Rooms inspected
Judging begins sometime between 3:30 and 4:00

5:30–6:00 PM

Judges return to room A313 (Physics Lab) with completed packets (calculators available)
Judges now have access to sandwiches in room A313 (Physics Lab)
Rooms inspected
Sophomores return boards to A214 (Research Room)
Sophomore teachers provide students with color-coded food tickets
Sophomores allowed in room A313 (Physics Lab) in groups of ~30 by ticket color
Last call for food
Juniors and Seniors assist with clean up

6:00 PM

Symposium for SUNY Albany students held on second floor (room TBA)



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Judges

Teachers

Gloria Aklipi, Mary Bomba, Brian Boom, Leila Cohen, Margaret Desimone,
Liz Fennamore, Wing Tong Lung, Barry Saines, Howard Spergel, Alan Stack

Alumni

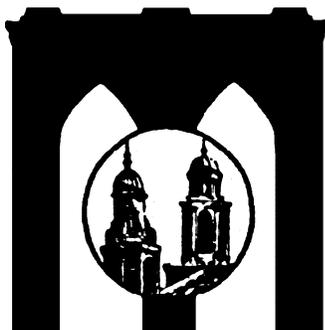
Santo Abraham, Anika Ahmed, Rabia Ahsin, Santina Bonsignore, Stephen Braverman,
John Ferrara, Regina Gurevich, Stephanie Heyligar, Faiza Iqbal, Kerry Li, Jason Lu,
Elina Melamed, Lisa Pang, Demetrios Papazaharias, Leon Telis, Frank Tidd, Vickie Wu

Seniors

Alexandr Afanasyev, Amanda Chan, Grace Chan, Joanne Chau, Laura Cheng,
Olga Gulyayeva, Rabia Iqbal, Ednerlande Jean, Maria Kofman, Theresa Law,
Clarice Lee, Tatyana Lemelman, Lisa Lin, Ying Yao Louie, Nicholas Macaluso,
Adis Malevic, Michael Monaghan, Andrew Morel, Lima Nusrat, Farhana Pinki,
Sharmin Rahman, Anastasiya Shulman, Kurnvir Singh, Christine Truong,
Lawrence Tse, Julian Yuen

Juniors

Michael Akyuz, Wesley Brooks, Claudia Chan, Tamara Charles, Pei Ling Chen,
Joseline Cruz, Famba Diane, Saraa Elkhaloui, Keira Graham, Dana Green,
Kirill Grinberg, Amy Guan, Viktoriya Halkina, Alicia Harris, Tayeba Hasan,
Emeiko Hunte, Kimberley Itskov, Anna Jacobson, Mohamed Kadik, Avis Karpman,
Rachel Kehinde, Nikita Korol, Stanley Krasner, Jenny Lee, Margaret Lee, Rebecca Leger,
Stephanie Lew, Jennifer Li, Yvonne Li, Wenona Lok, Anastasiya Matveyenko,
Humera Mohammad, Carmen Mui, Lyubov Neglyad, Emily Ng, Nicole Ng,
Ardiana Nikci, Francisca Onyiuke, Mercy Palomeque, Felicia Parris, James Parziale,
Ifrah Saleem, Nafi Shabnam, Rose-Ann Thomas, Zhaona Wang, Cynthia Xue,
Andy Yee, Wendy Yu, Fuad Zaher, David Zilberman



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Participants

- 316-18 Brandon Abrams
Do Free Radicals Affect Cell Division and Survival?
- 316-05 Brittni Adekoya
Which combined acidic neutralizer and substance work best?
- 314-03 Mohamed Adnan
Eco Bully
- 316-08 Saira Alam
Fresh Fruit?
- 316-14 Vilanya Arriaga Stephanie Chen
99.9% Germs Killed!
- 320-08 Nargiza Babaeva
Affect of Fertilizers on Germination of Seeds
- 318-11 Emanuel Bazov
The Ultimate Stealth Aircraft Revolution!!
- 318-20 Daniel Brown
Improving the effectiveness of a wind turbine.
- 316-09 Mitchell Buslovich
Which Lettuce is the Safer Choice: Organic or Conventional?
- 314-13 Irasema Capistran
Amount of Oil in Different Snack Products
- 320-09 Reginald Chan
Decomposing Superworms
- 316-11 Choi Chao
Hydrogen, the Combustible Fuel
- 316-20 Marian Chee
Concentration of Vitamin C in Orange Juice
- 318-07 Amy Chen Sandy Tam
A Convo to Die For!
- 316-15 Harry Chen
Hello? Can You Hear Me Now?
- 314-17 Mercede Chen
Good Fruits Gone Bad
- 316-12 Susan Chen
Bittersweet-Ness
- 320-12 Yi Chen Elizabeth Xochimitl
Where Is The Vitamin C In My Apple Juice?
- 320-11 Chi Vein Cheng
Ear-Blasting Commercials
- 318-13 Christopher Cheong
Which Agricultural Method is Best Suitable for the Survival of Plan
- 320-17 Rachel Chesser
Investigating Family Prints
- 319-12 Matthew Chin
Testing the Effectiveness of Different Concentrations of Listerine
- 314-11 Tianna Chin
Eyes On You
- 316-13 Kristina Consomer
Germ Be Gone?
- 320-21 Claudia Contreras
Mommy I Got a Booboo
- 319-05 Andrew Dabydeen
The Evaporation Rates of Alcohols with Different Amounts of Carbon
- 319-19 Dalia Fabius
Got Milk? What Kind? Almond milk vs. Cow milk
- 318-06 Mohammed Farajee
Permanent Markers Permanent
- 316-10 Aneisha Goffin Chelsea Gill
The Effect of Temperature on the pH of Juice
- 318-04 Doris Goldych
Which way to go?
- 316-02 Deshawn Harrison
Full of Energy?
- 320-15 Rinnell Hazel
Pain, Pain, Go Away
- 320-16 Irene He Pinar Nur Kanay
Heartbeat, Heartbreak...
- 318-21 Abrar Hossain Steven Vil
The evaporation rate of different liquids

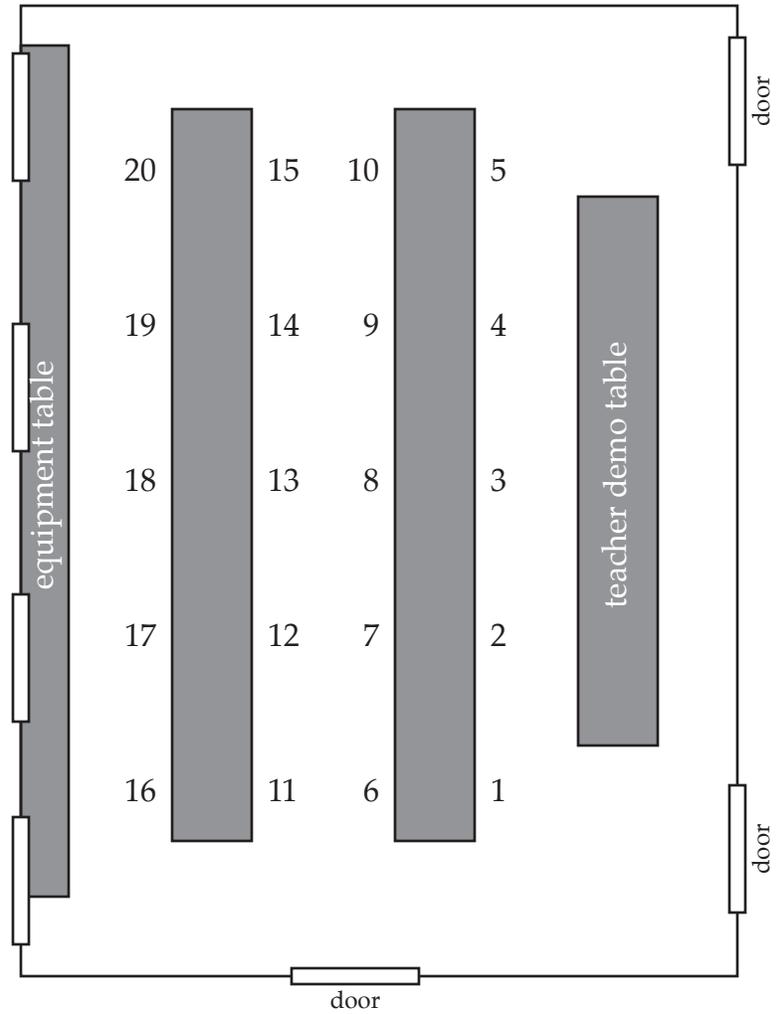
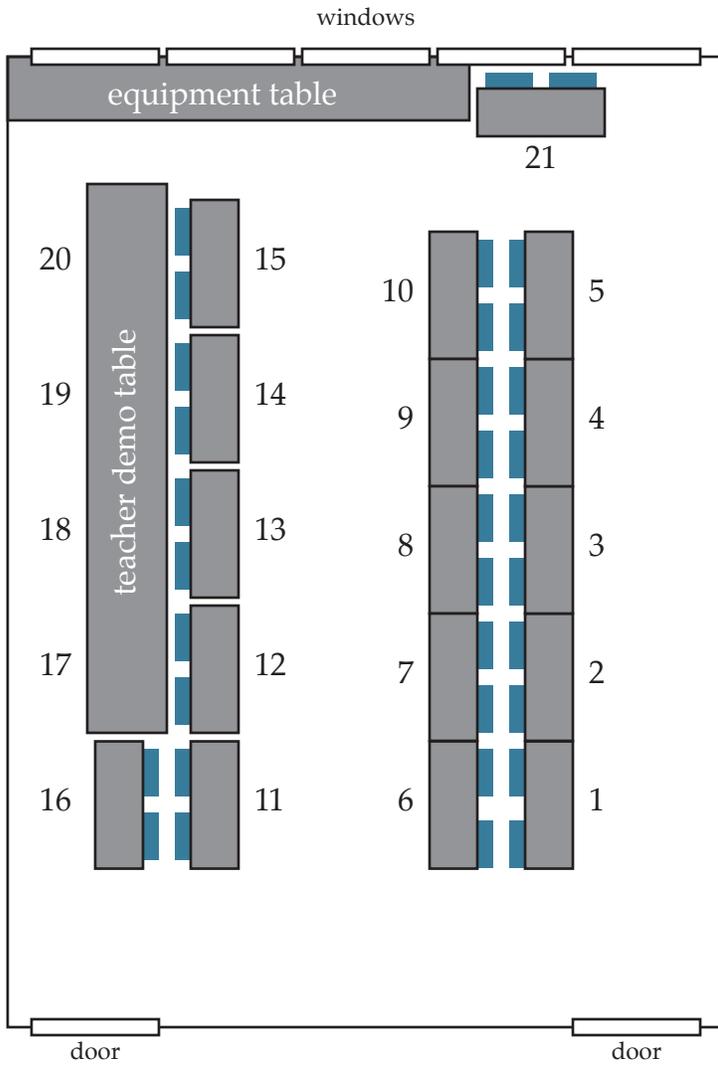
- 319-15 Michael Huang
The Best Glow: The Affect of Luminol on Different Surfaces
- 314-14 David Iskhakov
How Does Friction Affect Moving Objects?
- 316-16 Tayyaba Jabeen
Defeating Acne: Garlic vs. Benzoyl Peroxide
- 314-09 Tammy Jiang
Never Thought I'd See the Light
- 314-19 Farjana Kabir
Which Mouthwash Kills More Bacteria?
- 314-04 Ammara Kalim Sophia Tse
Detecting Hidden Toxicity Within Our Neighborhood
- 319-07 Mert Kemal Keceli Charli Frankel
The Secret Is in the Beads
- 320-18 Meral Kerim
Up, Up and Away!
- 319-04 Jessica Khaimova
Memory, B-Sharp
- 314-12 Rebecca Khaimova
Intensifying the Hair Without it Dye-ing
- 316-19 Anastasios Kostikas
Melt Away
- 318-03 Andrey Kovalev
And the best mouthwash for you is...
- 318-16 William Lam
Which has more Vitamin C, Fresh, Frozen, or Canned Foods?
- 318-14 Gabrielle Langston
How Safe is Your Drinking Water?
- 316-07 Kevin Lee
"Magnetized Water" and the Germination of Black Eyed Peas
- 316-04 Maggie Lei Candy Nguyen
Sugar, Spice and Everything Nice
- 319-14 Sarah-Lee Lewis
Variations in Fingerprint Patterns based on Biological Relationship
- 318-01 Jiayi Li Xiao Kuang
Meating Bacteria
- 319-02 Joan Li
Oh Snap!
- 318-19 Michelle Li
Disinfection of Contaminated Water
- 320-07 Dong Hong Liang
Salty Ice
- 314-06 Jian Lin
Sleep Tight!
- 319-03 Joyce Lui Emilee Yang
I scream, SUN SCREEN!
- 319-20 Diana Lum
Germinating Zinnia Seeds in Unusual Conditions
- 319-18 Carla Macias
The optimum amount of salt to melt snow
- 320-01 Andrey Moiseyenko
A Study of the Effect of Music on Concentration
- 318-18 Ian Morel
Battle of the Batteries
- 319-17 Vivian Ng Albert Murzakhanov
The Phenomenon of Genetically Modified Organisms
- 320-19 Wei Ni
Acid, Conductivity, and Electrolytes: Maintaining Your Body's Balance
- 319-06 Zoha Noor
Stressed Out From Salt
- 314-08 Naufa Nuha
How Does Listening to Music Affect your Problem Solving Proficiency?
- 319-13 Emily Pan
Electrolyte Competition: Orange Juices vs. Sport Drinks
- 314-21 Sana Parvaz
The Effect of Temperature on Lipase Enzymatic Activity
- 320-14 Clifford Philogene
Grass: How Much Water Does it Really Need?
- 319-09 Latisha Pollard
Is there a difference between detergents with enzymes and without ?
- 318-09 Faiyaz Rahman
The Dynamic Effects of Distance on Potatoes and Plant Growth
- 314-02 Gazi Rahman
Fingerprint Identification
- 318-12 Tinicia Ramdass
Which environments affect the rates of mold growth?
- 319-08 Taylor Ramos
To Dye for Hair
- 320-02 Faryal Razzaq Sadia Nusrat
Ready, Set, Apply: Take Action Against Dandruff
- 320-04 Natalya Romanyak
You Don't See Me But I Cu
- 320-10 Samuel Rubinstein Joey Wu
Soil in Brooklyn: Fuggedaboutit!

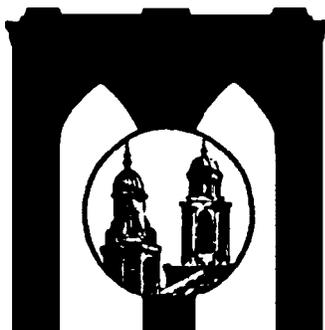
- 314-15 Aisha Saeed
Electrifying Beverages
- 320-06 David Shmidt
Affect of Drinks on the Enamel
- 319-01 Saba Siddiqi
pH Level Dilemma
- 318-08 Leroy Sin
Preserving With Preservatives
- 314-07 Hosni Sirhanshiraji Ken Han Chiu
Reaching Temperature Equilibrium When
Merging A Hot and Cold Water
- 316-21 Stephanie Situ
Salt-ubility
- 319-10 Ksenia Slesareva
Canned or Frozen?
- 320-20 Jennifer Snetkoff
Which Reliever Can Fight This Fever
- 316-03 Aiman Syed
Which solvent is most effective in removing
permanent marker?
- 320-03 Annie Tam
Environment Conditions on Fingerprints
- 319-16 Joanne Tan
Evaluate Saturation In Cooking Oils
- 316-01 Janice Tran Aya Itani
Got Milk?
- 318-10 Shirley Tran Sonia Sharmin
Do beans grow at different rates when given
different fertilizers?
- 318-15 Mark Trosman
What is the "brightest" way of absorbing
solar energy?
- 318-02 Christina Tsoi
The Attack of the Waves!
- 318-05 Joshua Wadler
Hurricane Warning - Relax
- 314-16 Karen Hui Wang Nicole Almaraz
Experimenting With Water Wheel Paddle Angles to
Generate Energy
- 314-18 Hai Yan (Ann) Wen
How will Different Solutions Impact the Lifespan of
a Bubble?
- 314-20 Megan Wong
Growing Plants in Space?
- 314-10 Raymond Wu Tim Chak
A Cure to Stains
- 314-01 Amanda Ye Jacinda Zhou
There's No Need to Fear, Garlic is Here!
- 319-11 Jenny Yeung
The Elimination of *Serratia marcescens*
- 318-17 Michael Yip Ricky Lok
Toxic Chemicals Turned Harmless?
- 320-05 Daniel Zairi
Which brand of batteries are the best and which
environment is best
- 314-05 Andy Zhang
Caffeinated Plants: Get High or Die?
- 320-13 David Zhang
Effectiveness of different sunblocks against UV rays
- 316-06 Heng Zhang
Which kind of heartburn medicine is best at
relieving heartburn?
- 316-17 YaQun Zhou
Slippery Situation

Room Arrangements

A314, A316, A318, A320

A319 (Chemistry Lab)





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Abstracts

316-18 Do Free Radicals Affect Cell Division and Survival?

Brandon Abrams

(Ross – Microbiology)

Cigarette smoke is a known cause of birth defects and secondhand smoke is known to cause developmental problems. It is known that cigarette smoke causes ischemia, causing cell death. This is because hemoglobin found in red blood cells possesses a greater affinity for carbon monoxide, than oxygen. An alternate explanation might be that free radicals, which are created as a result of high energy reactions such as with cigarette smoke, may be the cause of oxidative damage to the cells and their DNA (Wu, 2003). Since bacteria do not require respiration and thus do not need oxygen to obtain ATP, they serve as a model organism that can be used to lend credibility to this alternate hypothesis. If correct, this free radical theory has major health implications. For this experiment, agar dishes with *E. coli* will be placed in a testing chamber, next to the car muffler of a car. The plates will remain for a length of 5, 10, 15, and 30 minutes, while there will be a control which will not be placed in the chamber. It is hypothesized that the free radicals present in automobile exhaust can cause oxidative damage to cells, causing a decrease in cell viability and reproduction. As exposure time to car exhaust increased, the affected area increased as well, indicating a decrease in cell viability and reproduction. Based on these results, the hypothesis was correct. This experiment lends credibility to the free radical hypothesis for damage to DNA, causing long-term health effects.

316-05 Which combined acidic neutralizer and substance work best?

Brittini Adekoya

(McDonnell – Medicine)

The conduction of my experiment involves the testing of acidic neutralizing tablets in different substances. This experiment will then determine which acidic neutralizing tablet and substance work best to neutralize gastric acid. This experiment is relatable to society due to the fact that many people suffer from stomach discomfort which is caused by an unbalance of acids in the stomach. If this issue remains untreated, it could lead to some severe problems. For this reason, I feel it would be very informing if for people to know what would be the best acidic neutralizer to take with the best substance. The procedure I used for determining the best solution for my experiment was to first test the pH level of the substance. Then I added to acidic neutralizer into the substance. Lastly, with both the acidic neutralizer and the substance combined, I tested the pH level again and determined to difference between the solution before and after the acid neutralizer was combined. I will also determine which solution works best together to neutralize gastric acids. For my results, I expect to find that water and Tums would be a better solution for neutralizing gastric acids. I say this due to that fact that water is already a neutral substance on the pH scale. Also, Tums contains more ingredients which would probably play a role in why it worked so well in water.

314-03 Eco Bully

Mohamed Adnan

(Ross – Products)

Cleaning products these days claim that they are eco friendly. These products are put to the test by spraying eco friendly products to check if they had a significant effect on the plants. Celery and Broccoli plants were used and were sprayed with furniture polish, odor and stain remover, and floor cleaner. Another set of plants were sprayed with the same types of products except that they were not eco friendly. They plants were sprayed and recorded for 2 weeks. The eco friendly products should have little or no affect on the plants because of their claim of posing no threat to the environment.

316-08 Fresh Fruit?

Saira Alam

(Sullivan – Products)

In this project the type and brand of wrapping was tested to see which would preserve fruit the best. The types of wrapping used were plastic wrap and aluminum foil. Three brands of each wrap was tested. The fruit used were apples, oranges and grapes. They were wrapped in each kind of wrapping and left at room temperature for five days. At the end of the five days they were checked to see which wrapping kept the fruit in the best condition. the winner was Reynold's Wrap Aluminum Foil.

316-14 99.9% Germs Killed!

Vilanya Arriaga & Stephanie Chen

(Sullivan – Microbiology)

The objective of our project was to find out which liquid hand soap would have the most affect on the bacteria. The bacterium that was used in this experiment was a type of skin bacteria called Staphylococcus Epidermis. We used 6 different brands of liquid hand soaps: Lucky, Lysol, Ivory, Bath & Body Works, Dial and Soft soap. The soap showing the greatest zone of inhibition was the one that worked the best. The zone of inhibition is the area where no bacteria are growing which shows a clear area. Dial had the greatest zone of inhibition with the average of 31 mm. Dial, aside from Triclosan, had many other germ killing substances. This may be the reason why it had the highest zone of inhibition.

320-08 Affect of Fertilizers on Germination of Seeds

Nargiza Babaeva

(Ross – Plants)

Fertilizers are materials added to soil for the improvement of plant growth. There are four types of soil being tested in this experiment: organic fertilizers, inorganic fertilizers, plain soil, and the mixture of an organic fertilizer with an inorganic fertilizer. The types of plant seeds used in this experiment were lima beans. The hypothesis was that the lima beans growing in the organic fertilizer will grow the best out of all the plants. The experiment proved the hypothesis to be correct, the lima beans growing in the organic fertilizer grew the most. This result was due to the composition of the different types of soil. Organic Fertilizers contained more micronutrients that plants needed, for example: nitrogen, phosphorus, and potassium. The fertilizer was also composed of organic micronutrients rather than the inorganic fertilizer which was composed of chemically made nutrients. The soil was not made up of enough micronutrients which would make a plant grow fast and healthy. Finally, the mixture of organic and inorganic fertilizer didn't grow the best because it was counterbalanced with the organic fertilizer which didn't allow the plant to grow fast. The inorganic and organic fertilizer didn't allow the micronutrients of each other to grow. This was a very interesting project which actually could help anyone in life. Plants are one of human needs and we should grow plants faster and healthier!

318-11 The Ultimate Stealth Aircraft Revolution!!

Emanuel Bazov

(Ross – Physics)

In this experiment, different shapes will be tested to determine what type of shape reflects the least light, and so how aircrafts should be made in order to do this. These shapes will be made out of cardboard and paper and everyday household items will be tested. The material will be folded and tested, then folded again and so on to determine if a flat, bent, and concave shape is best than say a completely flat piece of paper or a cylinder of some sort. The test shape will be put into a closed box that has a hole just large enough for a flashlight to stick through. A lux meter will be used to measure the amount of light reflected (its sensor will be attached to the wall of the box opposite the shape, but on the same side as the flashlight). The inside surfaces of the box must be covered in black construction paper. The results did not support the hypothesis that the shape with the most folds and bends will scatter the least light, these shapes were in fact among the shapes that scattered the most light. This is due to sources of error such as the hole letting in too much light, and the construction paper peeling off a little.

318-20 Improving the effectiveness of a wind turbine.

Daniel Brown

(McDonnell – Environment)

Wind energy is taking over the energy industry. Using wind energy does not cause any pollution like other energy sources. Typically wind turbines are seen with three long propellers. Even though that is effective, does changing the number, size, shape effect how effective the turbine is? Changing these main things about the turbine could generate more energy. If it is found that these changes to positively affect the energy generated then turbines could be upgraded and could function in a more positive way. This could also end up lowering the cost of energy and make it more affordable for everyone.

316-09 Which Lettuce is the Safer Choice: Organic or Conventional?

Mitchell Buslovich

(Sullivan – Microbiology)

My project was designed to study the amounts of Gram-negative bacteria colonies on conventionally grown lettuce compared to organically grown lettuce. The difference between organic and conventional lettuce is the way in which they are grown. More specifically, the farmers treat conventional lettuce with pesticides and growth hormones (types weren't specified on the packaging). The organic lettuce on the other hand was grown completely naturally without any additives. I swabbed both heads of lettuce and applied it to a plain agar dish that grows all types of bacteria as my control and I also applied it to the MacConkey agar, which only grew Gram-negative bacteria as my experiment group. Gram-negative bacteria stains red on Petri dishes. Some examples of Gram-negative bacteria are E. Coli and Salmonella. These bacteria are very dangerous for your body and can cause you to be very ill. I did this experiment for the purpose of concluding whether organic lettuce is actually healthier than conventional lettuce. My results proved to be inaccurate. Organic lettuce had a significantly higher amount of Gram-negative bacteria colonies as compared to conventionally grown lettuce. My recommendation to a consumer would be to save their money and to not risk their health by purchasing regular lettuce (which has fewer Gram-negative colonies) as opposed to organic lettuce.

314-13 Amount of Oil in Different Snack Products

Irasema Capistran

(Sullivan – Medicine)

Many snack products that are consumed daily contain many grams of fat. Despite the fact that the grams of fat are not on the nutritional label found on the back of most

products, it can be looked up. In this experiment three different snack products which were popcorn (Wise Butter and Cheddar Popcorn), potato chips (UTZ Sour Cream and Onion, and Onion Rings) and cookies (Nabisco Oreos and Chips Ahoy) were tested for the amount of oil they contained on the surface of the product. The purpose of this experiment was to compare the grams of fat of each snack product tested and the size of their grease stain. The Onion Rings which contained the least amount of grams of fat (6g) also yielded the smallest grease stain; followed by the Oreos, Sour Cream and Onion, Chips Ahoy and Butter Popcorn. On the contrary, the Wise Cheddar Popcorn which contained the greatest amount of fat grams yielded the biggest oil stain. Therefore, it was concluded that as the grams of fat increased the size of the oil stain also increased. However, this is not true for two snack products. One was UTZ Sour Cream and Onion which had more grams of fat (10g) as compared to the Chips Ahoy (8g), yet it yielded a smaller grease stain. This can be attributed to the discrepancy between the boxes covered partially with oil.

320-09 Decomposing Superworms

Reginald Chan

(McDonnell – Environment)

What do you get when you combine worm and decomposition? You get worm decomposition. Corny right, yes pretty corny for an abstract, but worms decomposes corn into compost, but its not just regular compost its vermicompost. Vermicompost is very different form regular compost because it is several time richer in inorganic materials. To do this experiment I had to buy 2 pounds of red worms [red worms should be use not night crawlers] then build my own compost bin, where the worms will live. For the experiment I'm trying to find what types of fruits worms would like the most by seeing if they would eat or how much they eat of the fruit. I would place different types of food on the corner of the bins and wait a week to record the outcome. Most likely worms would have a sweet tooth and most likely eat an apple then an orange.

316-11 Hydrogen, the Combustible Fuel

Choi Chao

(Ross – Chemistry)

In this experiment, students will separate hydrogen and oxygen in different kinds of liquids including bottled water, tap water, salt water, soap water and vinegar water. Electricity is created when certain chemicals react together. People use chemically made electricity to power many machines from flashlights to a watch or sometimes a car. Water is a simple chemical made from two gases: hydrogen and oxygen. Every molecule of water has two atoms of hydrogen for every atom of oxygen therefore H_2O is the Chemical formula for water. If an electrical current is passed through water between electrodes the water is split into two parts: oxygen and hydrogen. This process is called electrolysis and it is important because it is used in industry in many ways, such as making metals like aluminum and hydrogen can provide fuel for clean- burning cars. The ideal situation is to have hydrogen replace ordinary gasoline. Therefore, Students in this experiment will be testing which of the water produces the most hydrogen.

316-20 Concentration of Vitamin C in Orange Juice

Marian Chee

(Ross – Products)

I used the method of acid- base titration to determine the concentration of Vitamin C in different types of orange juice. If titration can be used to find the concentration of a solution, then fresh squeezed orange juice will contain the highest concentration of Vitamin C. It took an average of 4.64 mL of Iodine to titrate 20 mL of fresh squeezed orange juice and it contains 6.69 mg of Vitamin C. It took an average of 3.18 mL of Iodine to titrate 20 mL of orange juice from concentrate and it contains 4.58 mg of

Vitamin C. It took an average of 3.13 mL of Iodine to titrate 20 mL of orange juice not from concentrate and it contains 4.51 mg of Vitamin C. My hypothesis was supported. The fresh squeezed orange juice had the highest concentration of Vitamin C. The orange juice from concentrate came in second place and the orange juice not from concentrate came in third place. A source of error was that I didn't know when the endpoint was and I might've past the endpoint without knowing. If anyone were to repeat this experiment I would recommend them to buy the exact materials listed, be careful of the Iodine, hotplate, and glassware, and titrate the orange juice samples drop by drop.

318-07 A Convo to Die For!

Amy Chen & Sandy Tam

(Aubrey – Behavior)

People die every day, but exactly how many die from careless cell phone use while driving? Statistics increase a little every year as more and more people are dragged into the population who talk on cell phones while they drive. About 4,383 accidents occur every day from car accidents due to people neglecting their driving responsibilities by using their cell phones while managing a vehicle. In order to increase the awareness of the dangers of cell phone use while driving, an experiment has been conducted on high school students to test driving accuracy under a single distraction. People of the newer generation claim they can multitask and still be able to drive safely. Due to their neglected responsibility, the statistics for car accidents have raised a steady rate annually. This study among high school kids who have yet gained their driver's license aims to inform and educate young adults about the risks they're taking by using a communication device while driving. Hopefully, this experiment will lead some high school young adults to pass on the knowledge they gained from this experiment to other peers. Perhaps under peer influence, students will drive legally and safely in the future. In order to ensure safety in this experiment, a bicycle was used instead of a car. This bicycle was ridden by test subjects, grades ranging from 9 through 12. Each subject had 10 minutes to warm up on the bicycle before they were due for testing. They then ran through a course for a total of 6 trials. During each trial, the driver on the bicycle had to weave through 16 cones, timed. Then, the cones that were hit were counted and recorded. The first three trials were under normal driving conditions, legally, without a communication device or any other distractions. The next three trials included a changed factor. This time around, each test subject had to wear an earpiece with the cell phone (for safety purposes) and talk a continuous conversation until the end of the obstacle course. A list of 15 questions was used on every test subject and proved to be answerable.

316-15 Hello? Can You Hear Me Now?

Harry Chen

(Aubrey – Behavior)

Have You ever wondered if multi-tasking is beneficial in the long run? Now apply that to driving; should people really talk on the phone while on the road? Surveys have shown that 85% of drivers often use their cell phones while driving. The problem that I'm investigating is if a cell phone conversation affects the reaction time of a person. The way that I'm approaching this experiment is by conducting two trials per each participant. On the first trial I am going to place a ruler directly above a participant's outstretched hand and without warning drop the ruler. I will record (in inches) their number and convert it to seconds using a conversion table found online. On the second trial, I will be doing generally the same thing but instead, I will be "calling" my participants and ask them a series of questions. The purpose of this is to keep them occupied and then without warning drop the ruler. I chose this topic because I've always wondered if driving whilst on the phone is really a bad thing to do and what consequences may result. based on my experiment, I can answer my question because my results may show that people generally tend to take longer to catch the ruler (their reaction rate was reduced) on the second trial as opposed to the first. If a person's reaction rate is slowed while driving, then they are more likely to get into a car accident.

People tend to pay more attention when they are concentrated on one specific thing at a time as opposed to two, so it would be probable that focusing on the road is more efficient compared to trying to focus on the road AND having a conversation on their phone at the same time.

314-17 Good Fruits Gone Bad

Mercedee Chen

(McDonnell – Plants)

Fruits are a huge part of our daily required nutrition and vitamins. How long exactly do we know the freshness of a fruit will last? Eating a decomposing fruit would most definitely not be a pleasant thing to taste. In addition, it may not even taste better than eating a fresh fruit. We could probably save more fruits for digestion than waste them, in a weeks' worth of time. To obtain this type of knowledge of fruits, I am testing and recording the time period in which it takes bananas and green smith apples to fully decompose. To perform this experiment, the fruits would be placed in different locations for a long period of time. For example, the bananas and green smith apples can be placed on a window sill, refrigerator, etc. I hypothesized that the warmer the environment the fruit is placed in, then the faster the fruits will decompose. Drawing a graph and marking down the locations of the parts where decomposition is occurring day after day will help me keep track of this record. When the fruits have changed their colors completely, the number of days counted would be the number of days it takes for the fruits I used to fully decompose.

316-12 Bittersweet-Ness

Susan Chen

(Ross – Behavior)

The science project that I had is testing which gender's taste receptor cells is more sensitive, males or females. For the experiment, I had gathered thirty volunteers with fifteen males and females. For testing whether whose taste receptor cells are more sensitive, I had used orange juice and toothpaste. It was known that drinking orange juice after brushing teeth had caused a mass bitterness to the taste buds. The reason is that an ingredient in the toothpaste called Sodium Lauryl Sulfate had numb the sweet taste bud, thus had led to drink only the bitterness of the orange juice. I hypothesized that the females have a more sensitive tongue receptor cells because they had more taste buds than males. By timing every two minutes to each volunteer until they taste the sweetness of the orange juice, I had gathered my data and performed a t-test. The results had proven my hypothesis to be correct. The females took an average of 6.5 minutes to taste the sweetness whereas the males had taken 6.3 minutes. The source of error could have been that the volunteers had lied about their tasting, saying that they taste no bitterness when they actually do, etc. However, I can't find any reason why they would lie about it.

320-12 Where Is The Vitamin C In My Apple Juice?

Yi Chen & Elizabeth Xochimiltl

(McDonnell – Products)

The goal of our project is to test if the amount of Vitamin C stated on the nutrition facts label are accurate. Getting the required amount of nutrients is important for one's health. Therefore, many people look at the nutrition facts to see if they get enough nutrition from that food source. The nutrition facts for this reason should be accurate. To find the amount of vitamin c we will do titration. Starch indicator solution will be used to titrate the solutions. When solutions turn a blue-black color the titration is done. After doing the experiment we learned that the juices contained different concentrations of vitamin c, even though they all said to have 100 % Vitamin C. Ssips fruit juice brand has the least amount of Vitamin C than the other fruit juices that were tested. The fruit juice brand Minute Maid contains the most amount of Vitamin C from other fruit juice brands that were tested. After doing some research, we discovered that not only lacking

Vitamin C is bad, but also having too much isn't good. It is difficult to have too much though, because the amount of Vitamin C that should be consumed for it to be too much is 2000 mg of Vitamin C per day. Therefore, the nutrition fact labels should be accurate to inform consumers with correct information.

320-11 Ear-Blasting Commercials

Chi Vein Cheng

(McDonnell – Products)

People have to constantly turn down their volume when the commercials go on the TV. We see advertising everyday, it affects our daily life, so when does it have a limit? There is a study that kids know what McDonald's is before they know who George Washington is. This project looks at how much louder commercials are than TV shows. The average noise level of a TV show and a commercial will be measured and compared in decibels. It was shown that commercials are significantly louder. This could provoke some limitations on how loud commercials can be.

318-13 Which Agricultural Method is Best Suitable for the Survival of Plant

Christopher Cheong

(Ross – Plants)

Since man has learned to grow plants, humans have always wanted to find a way to grow plants faster and with as little effort as possible. Governments have spent millions of dollars, and companies have created many different methods such as fertilizer and mulch to grow plants faster. This experiment will be testing which growing method will have the greatest effect on the growth of pea plants when under stress of constant heat and low amounts of water. If the plants can thrive under such stress then that means that the plant requires less effort to maintain while gaining the same results. The methods being tested are a plastic membrane placed around the soil of the plant, a mulch and a non Newtonian fluid, the set of plants with the greatest height will determine which growing method is best for the survival of plants in an area with little water, or required the least amount of effort.

320-17 Investigating Family Prints

Rachel Chesser

(McDonnell – Medicine)

It came to my mind one day while I was watching CSI: Crime Scene Investigators; just how can people use fingerprints to narrow down suspects so accurately? Knowing that everyone has their very own unique set of fingerprints, is it possible that there can be certain similarities among some? Among family members, that would make sense. Since a child inherits all his/her genes from his/her parents, fingerprints might also be inherited. In order to determine whether or not fingerprints are inherited, I had to collect fingerprints from 30 different families and analyze them. I found many common patterns among each and every family as I observed them all. This provided evidence that fingerprints are inherited. Although they aren't the same, if you compare a child's fingerprints to the fingerprints of the child's parents, you will find a resemblance.

319-12 Testing the Effectiveness of Different Concentrations of Listerine

Matthew Chin

(McDonnell – Products)

Did you ever wonder if using a smaller amount of Listerine would be just as powerful as using it at full strength? Does using more Listerine really mean more bacteria reduction? Listerine is an alcohol based substance that kills many types of bacteria found in the mouth that may be harmful to the teeth. The mouthwash product, Listerine, will be tested for its effectiveness on bacteria similar to those found in the mouth. There are six different test solutions, a control of 0% Listerine, 20%, 40%, 60%, 80% and 100% of Listerine mixed with distilled water. It would be expected that the

concentration with 100% would have the greatest zone of inhibition because the high concentration of alcohol in the solution, however, an 80% or 60% solution may have the same average zone of inhibition. The bacterium that is tested in this experiment is *Serratia marcescens* and *Staphylococcus epidermidis*. If lower concentrations work just as well as a 100% concentration, then everyday consumers would save money on how much mouthwash they use.

314-11 Eyes On You

Tianna Chin

(Sullivan – Behavior)

Many people around the globe claim that they can feel when someone stares at them. There is no scientific foundation as to why this strange feeling occurs. Many beliefs include that it is religious, an aura, or a parietal eye. This project looks into the validity of these claims by looking at various individuals and timing reaction rate. This was followed by a series of questions. My hypothesis was that the sensation when someone stares at you due to their eye catching you through peripheral vision and that females will turn around faster. The hypothesis was slightly supported, it was discovered that it is most likely due to peripheral vision, after the questionnaire was given, and males turned around faster.

316-13 Germ Be Gone?

Kristina Consomer

(McDonnell – Products)

When using Lysol™ Disinfectant Spray or any other household cleaner to clean *Escherichia coli*, is using more necessarily better? It may not be, using less may be just as effective as using a greater amount. In order to determine this, it is necessary to test the concentrations of these disinfectants, for this particular procedure Lysol™ Disinfectant Spray will be used. There will be six different concentrations that will be tested on *E. coli*, 100%, 80%, 60%, 40%, 20% and 0%. I expect to find that using 100% of Lysol™ Disinfectant Spray will be able to show the highest zone of inhibition. Though, 80% and possibly 60% may also be just as effective as the 100%. If this happens, it will show that using less of this product, Lysol™ Disinfectant Spray, may work as well as using more, therefore, the consumer may not have to buy as much, saving them money while killing all of the bacteria.

319-21 Mommy I Got a Booboo

Claudia Contreras

(Sullivan – Microbiology)

Antiseptics are used to prevent infections on living tissue. Common antiseptics such as hydrogen peroxide, iodine, and isopropyl alcohol were used in this experiment. The purpose of this experiment was to determine which antiseptic destroyed *Escherichia coli* and *staphylococcus epidermidis* the best. Each bacterium had a total of six trials. Each trial was setup with hydrogen peroxide, iodine, isopropyl alcohol, and distilled water (served as control). All six trials were then incubated for a total of two days. Results were then observed and recorded. After measuring zones of inhibition and calculating the averages it was found that hydrogen peroxide worked best against *Escherichia coli*. In contrast iodine had the highest zone average in the case of *staphylococcus epidermidis*. Due to several sources of error it is not definitely determined that iodine is the antiseptic of choice.

319-05 The Evaporation Rates of Alcohols with Different Amounts of Carbon

Andrew Dabydeen

(Sullivan – Chemistry)

Many are interested with evaporation rates of alcohols especially those who are industrialists, which alcohols evaporate faster though, ones with small amounts of

carbon atoms in the molecule or ones with a greater amount of carbon atoms? The project that I am doing looks at different types of alcohols with different amounts of carbon atoms. I used five types of alcohols which were Methanol, Ethanol, Propanol, Butanol and Octanol and evaporated them all at 100 mL at a constant environment. My hypothesis was the alcohols with less carbon atoms will evaporate faster. My result was that my hypothesis was correct and alcohols with a great amount of carbon atoms evaporate at a slower rate.

319-19 Got Milk? What Kind? Almond milk vs. Cow milk

Dalia Fabius

(Ross – Products)

The argument is that almond milk (non-dairy) is better than cow milk (dairy). They are said to be healthier and contain less bacteria than cow's milk. This experiment tested the spoilage rate between low fat cow's milk and low fat almond milk. Also original cow's milk and original almond milk. This was done because it is known that the quicker a substance spoils the more bacteria it contains. The hypothesis was that if almond milk is healthier, then it would take more time to spoil, therefore suggesting less bacteria. It was also predicted that the low fat almond milk would outlast them all because of its low content in fat. To test this, there was a set up of twenty different cups with five cups testing the different types of milk at room temperature. The hypothesis was not supported. Original cow milk lasted the longest. It also seems as though the more content in fat, the longer it lasted. Sources of error may have been, the open air causing bacteria to grow where it may not have grown had the cups been covered.

318-06 Permanent Markers Permanent

Mohammed Farajee

(Sullivan – Products)

To briefly summarize experiment and the results, I started off by marking little squares of different surfaces of small circles with a black Sharpie permanent marker. I took my three solvents and poured them into the beaker. I took one square from the each type of surfaces. I dipped three squares into water first, and then I dipped other three into rubbing alcohol. The last three I dipped them into acetone. Water had no effect at all; rubbing alcohol had little affect on each surfaces. But acetone had the most affect by nearly taking more off than the other solvents.

316-10 The Effect of Temperature on the pH of Juice

Aneisha Goffin & Chelsea Gill

(Sullivan – Chemistry)

The purpose of this experiment was to test if temperature had an effect on the pH of juice. Before doing this experiment, it was hypothesized that in a warmer environment, the pH of the juice will decrease causing the level acidity to increase, in a cooler environment, the pH of the juice will increase causing the level of acidity to decrease and at room temperature, the pH of the juice will remain constant. Twelve different samples of juice were placed in different conditions and observed over a period of time. In every environment each juice showed a change in pH. In some cases juices became more basic and in other cases juices became more acidic. Preservatives and thermal degradation caused variation in the pH levels of the juice. The average percentage of significance for the room temperature juice was 89.7%. The average percentage of significance for the incubated juice was 90.375%. Pomegranate was the only juice that did not have a significant pH change in any of the conditions.

318-04 Which way to go?

Doris Goldych

(Aubrey – Products)

The purpose of this project is to see which stain remover detergent works best. This topic has an impact in our life today because people would like to know if buying this product would be a good investment and if it would present the results they hoped to receive. As customer's, people should be notified that the product they use will be effective since no one would like to waste their money on a useless product. Using certain various types of stains will be tested on different materials with Tide to go, Clorox pen and Dryel. Every piece of fabric will have a certain stain on it and each stain remover will be used to see if it can or cannot remove that stain. Then with researched information on this topic comparisons can be made to see which ingredient had made it possible to have the stain disappear. These products may also damage the clothing besides not removing the stain.

316-02 Full of Energy?

Deshawn Harrison

(McDonnell – Chemistry)

It has been wondered by teen and adult athletes if sports drinks are as advertised: full of electrolytes that revitalize your body. The researcher of this experiment has tested this problem. To do this the researcher has created a modified digital multimeter to test the amount of electrolytes in a sports drinks in conductance. The researcher has compared this amount to the amount in other liquids such as salt water and an aqueous solution of acetic acid. After this experiment, the researcher has found that the salt water had more electrolytes than the other liquids.

320-15 Pain, Pain, Go Away

Rinnell Hazel

(Sullivan – Products)

Pain relievers, or analgesics, are medications that relieve pain without causing the loss of consciousness. They are used to deal with mild to moderate pain. The digestive and circulatory systems play major roles when it comes to using pain relievers. The inner layer of the stomach is called the mucosa, consisting of parietal cells, g-cells, and epithelial cells. Parietal cells produce hydrochloric acid (HCl) which break down food in the stomach and keep the stomach at a stable pH level. When pain relievers go into the stomach, it is important that they are broken down quickly and circulated throughout the body. The faster that it is broken down, the faster the pain reliever can go through the body and to where it is needed. In this experiment, aspirin had the fastest dissolving time in hydrochloric acid. It was also the smallest and thinnest analgesic used in the experiment. When pain relievers are needed, it is recommended to use aspirin because of its fast dissolving time.

320-16 Heartbeat, Heartbreak...

Irene He & Pinar Nur Kanay

(Aubrey – Products)

This experiment incorporates modern interests of energy drinks in today's society. Our experiment is important because it deals with the effects of energy drinks on *Daphnia Magna*, which mimics the human body. Nowadays, more and more people indulge in energy drinks that boost performance rate, but are unaware of the effects. In our project, we are testing the effects of energy drinks on *Daphnia*'s heart rate. This has impact on our society because, without noticing, people overdose on drinks that may potentially be harmful to their bodies. By testing which energy drinks increases heart rate the most; we hope to prevent people from overdosing. The methods used for this experiment involve inserting a *Daphnia Magna* into 10 mL of solution and recording their heart rate for thirty seconds. The control for this experiment is plain bottle water to figure out the

initial heart rate. During the process of the experiment, we placed the individual Daphnia into a Petri dish, and were observed under a dissecting microscope to record their heart rate. The Daphnia were tested with water, Gatorade, Red Bull, and Vitamin Water. After the average of all three trials were taken, we calculated the percentage of the increase of heart rate, compared to water.

318-21 The evaporation rate of different liquids

Abrar Hossain & Steven Vil

(Sullivan – Chemistry)

Our experiment proved that alcohol evaporates at a faster rate than water and Scope mouthwash. This resulting from the fact that carbon cannot form hydrogen bonds making alcohol more susceptible to being broken down. In our experiment we tested alcohol and water along with mouthwash. Our results were showing that alcohol on each day had the greatest amount of liquid being evaporated. Mouthwash showed signs of evaporation, better than that of water, this was because mouthwash contained 8.6% alcohol.

319-15 The Best Glow: The Affect of Luminol on Different Surfaces

Michael Huang

(McDonnell – Chemistry)

Luminol Chemicals are used mainly by Forensic Scientists to detect blood by producing a blue-green chemiluminescence (glow) in a crime scene. Despite the effectiveness of Luminol chemical, the knowledge of the affect of Luminol Chemical on different surfaces can allow forensic scientists to process a more thorough investigation. Forensic scientist may possibly discover the places the crime has taken place and from this detection, further information may be uncovered. For this experiment, with my 5 surfaces (aluminum, plastic, wood, marble, glass), and my Luminol mixture of Luminol Chemical and water, I will set up 25 different experiments. With each surface, I will border a certain area, and within this space I will cover it with bleach solutions (substitution for blood). After the first experiment, for the remaining testing, an interval of 12 hours will be made until each testing to observe and measure how effective each surface is. As a result of completing the above procedure, I learned that glass surfaces are most effective with Luminol. This implies during a crime scene, if blood stains a glass surface, the possibility of producing chemiluminescence is greater than that of the other surfaces after a period of time.

314-14 How Does Friction Affect Moving Objects?

David Iskhakov

(McDonnell – Physics)

Friction is the force between objects that go up against the relative motion of objects. Reducing friction will cause things to go much faster and move along much easier than how they would move along when friction is involved. This project will test how different objects with almost the same surface are affected when moving by different types of friction. In order to get my results I learned about different materials that have a lot of friction and materials with less friction. I will attempt to conclude which item causes the most friction and which item causes less friction. Through research, I gathered up sandpaper, wood, and felt and tested to see how a wood block, plastic block, rubber eraser and a sponge will react with the tested surfaces. In conclusion, the research proved that sandpaper caused the most friction, because it has the bumpiest and roughest surface. Reducing friction will tell others to drive on certain roads, push carts on certain floors and help people get to their destination faster.

316-16 Defeating Acne: Garlic vs. Benzoyl Peroxide

Tayyaba Jabeen

(Ross – Medicine)

The purpose of this study was to determine if Garlic, a renowned herb for its antimicrobial properties, can be more effective in reducing acne than Benzoyl Peroxide, the common ingredient found in most acne-reducing products. The method used to determine the outcome was by using a 10% Benzoyl Peroxide cream and a pure form of garlic's main antimicrobial compound allicin. The two antibacterial agents were tested on both gram-positive and gram-negative bacteria. Although all acne is gram-positive, there is an unusual case of severe acne which is caused by gram-negative bacteria instead. Hence, it can be tested if garlic is also effective on gram-negative bacteria, such as E. coli, which is resistant to many antibiotics. The results, however, showed that although garlic was able to kill E. coli, the gram-negative bacteria, and Staphylococcus epidermidis, the gram-positive bacteria, to a slightly greater extent than Benzoyl Peroxide, the figures weren't statistically significant. This is possibly the first experiment which tested whether or not a known microbial agent can be more effective than a commonly used agent for treating acne vulgaris and even the severe case of gram-negative acne. It is also reassuring to know that garlic does kill bacteria involved in acne and thus is certain to be effective when used in home remedies. This study lays the foundation for further experimentation concerning the effect of common herbal supplements on acne vulgaris and even more severe cases of acne which may be resistant to most antibiotics but possibly not herbal supplements.

314-09 Never Thought I'd See the Light

Tammy Jiang

(Ross – Physics)

Have you ever wondered what would make a light bulb glow brighter? The key to answering the problem is the filament of the light bulb. A filament is a threadlike structure in a light bulb that lights up when there is electricity flowing through it. In this experiment, different kinds of filaments were tested in a handmade light bulb. The different filaments that were tested were a pen spring, galvanized wire, thick aluminum wire, a strand of aluminum wire, and copper wire. My hypothesis was that the aluminum wire would produce the brightest glow. To create a light bulb, a glass jar, such as a salt shaker with a plastic screw on top was used. Nichrome wires were attached to the filament at one end and to the power supply at the other end. The pen spring produced a dark red glow when heated up to between 2 to 3 amps. The galvanized wire did not emit any light. The thick aluminum wire produced a bright red glow at the ends of it. The rest of the wire oxidized and turned a rusty blue. When heating the one strand of aluminum wire, it broke and there was no glow. The copper wire from the speaker wire produced a dull red color. There were white sparks produced also, but there was no glow. The pen spring was the best filament since it produced the brightest glow out of the other wires. My hypothesis was not supported by the results.

314-19 Which Mouthwash Kills More Bacteria?

Farjana Kabir

(McDonnell – Products)

The purpose of my project was to determine which mouthwash kills more bacteria. First I prepared Petri-dishes with bacteria. Then I soaked filter paper disks in different mouthwashes. I placed these disks in the Petri-dishes according to their mouthwash. I did four trials for each mouthwash and I also had a control. I used two popular and expensive mouthwashes and two unpopular and cheap mouthwashes to determine which is more effective. I did this because I wanted to see if there is a correlation with the cost of mouthwash and how much bacteria it kills. The information gained from this project can be used by consumers to make better decisions about their oral hygiene.

314-04 Detecting Hidden Toxicity Within Our Neighborhood

Ammara Kalim & Sophia Tse

(Aubrey – Environment)

There are many current situations around the world dealing with water and how healthy it is. If you visit some countries with a weak economy and without a filtration system today, you can see how water is the cause of damaging their health rather than keeping them alive. This is due to the high water toxicity and the presence of toxic compounds in water. In order to detect different levels of water toxicity in different parts of a local area, we used the method of brine shrimp bioassay. Bioassay is known as the testing of toxicity using living organisms. The goal of this experiment is to test for the presence of toxic compounds in sediments from local areas such as parks, parking lots, and sidewalks. Our experiment involves the use of brine shrimp to determine the toxicity of water when sediments are present. After raising the brine shrimp for several days, we would add the sediments we collected into the environment in which the brine shrimp is raised in. By examining the brine shrimp population every twelve hours, we can determine the LC50 (lethal concentration) of our surroundings.

319-07 The Secret Is in the Beads

Mert Kemal Keceli & Charli Frankel

(Aubrey – Products)

You wish you had some sunblock to protect your skin from the dangerous UV light. So you walk into a shop. You see in the corner of your eye an aisle for sunblock. Which do you choose? You suddenly remember there was an experiment answering this very question. In the experiment, 6 different brands of sunblock were tested: Banana boat Kids SPF 50, Coppertone SPF 50, Rx sun care advanced protection SPF 50, and Neutrogena Ultra Sheer Dry Touch SPF 50. Six groups of UV light-sensitive beads were coated and each group was assigned a brand of sunblock. One group was used as a control without any sunblock. Each group (containing one bead) was placed under the UV lamp until the bead changes color. Each bead for every group was retested 9 times, for a total of 10 trials for each brand of sunblock. The time it took for this change to occur determined the efficiency of sunblock. This experiment used: 6 brands of sunblock, 7 UV light beads, UV lamp, Stopwatch, make-up brush, and 5 inch copper wire about the thickness of a paperclip. In experiments by consumer reports, Neutrogena SPF 50 worked the best against UV light. Banana Boat was one of the best sunblocks too. Coppertone had a lower ranking because it has to be applied more than the others. The two Rite Aid brands of sunblock were found to be less effective and uncomfortable on the skin. In these experiments, both humans and UV beads were used.

320-18 Up, Up and Away!

Meral Kerim

(McDonnell – Engineering)

In this time of bad economy, hovercrafts are great forms of transportation and serve as excellent load carriers. Cars, trucks and other vehicles produce gas that is harmful to our ozone layer. Hovercrafts, on the other hand, do not emit as harmful substances as our everyday vehicles do. Before building my hovercraft, I needed to analyze other homemade hovercrafts and designs for professional ones. As a result of combining multiple designs and basic hovercraft knowledge, I have invented a hovercraft that is home-friendly and can actually hover about an inch above the ground. In the future, hovercrafts are predicted to be the majority of vehicles because of their multipurpose uses and economical benefits as shown in my invention.

319-04 Memory, B-Sharp

Jessica Khaimova

(Ross – Behavior)

The purpose of this science fair project was to determine how music affects a person's word memory. The hypothesis was: If a person listens to music while memorizing words, then they'll remember fewer words. The procedure was as follows: give a student a list of 30 words to memorize (in two minutes), without music. Then, once the 2 minutes are up, tell the person to write the words that they remember for 1 min. Repeat these two steps for 16 more people. After that, repeat the last three steps (with the same 17 students), but this time, with music. Also, give the student a new sheet with 30 new words to memorize. The music must be of the students' preferences. The results supported the hypothesis. Students memorized more vocabulary words without listening to music. Students memorized more words because the preferred type of music offered distractions while memorizing the list. A source of error was that the testing locations were loud at times, which could've distracted the person that was tested.

314-12 Intensifying the Hair Without it Dye-ing

Rebecca Khaimova

(Aubrey – Products)

When coloring or dying hair did you ever think about how you are damaging your hair piece by piece and slowly making it thinner and smaller that it starts falling out more often, sounds scary doesn't it? Dying or coloring hair is very dangerous but many people do it either way so it's important that you pick the right company that would strengthen hair and be less likely to destroy it instead. The problem in this experiment is which hair coloring product strengthens hair the most. This is an important experiment to conduct because in the category of beauty people that color or dye their hair would know which product to choose. It is important to choose a hair color product that strengthens your hair when using because then it is less likely for it to damage your hair by causing split ends, making hair thinner and/or hair fall out more often. This experiment will be conducted by using natural hair and using four different coloring products with the same volume and color as well as a control group. Then using a device made out of blocks, the hair is taped to, dimes are placed one at a time on the hair until it can't hold the amount of dimes on it anymore and it breaks. The hair coloring product that works the best will be the one that holds the most dimes. Usually the hair that isn't treated at all is the strongest and then come popular companies like Clairol, Lisap Milano and Wella. The more dimes the strands of hair, for each hair coloring product hold, the stronger the strands of hair are. The hair products used are beauty professional hair products so it would benefit professional hair salons and they are Clairol, Lisap Milano, and Wella. These hair products are all color of red and must be mixed with a 1:1 ratio of 20 volume crème developer.

316-19 Melt Away

Anastasios Kostikas

(Ross – Chemistry)

Most of us learned that salt indeed helps ice melt faster but, the question is, why? Also, how do we know which salt melts ice the fastest and what's the reason for it? The speed in which a certain salt melts ice has to do with the ingredients. If there are elements such as, calcium chloride and sodium chloride, those make ice melt faster by lowering the freezing point of the ice. In this experiment, it will be concluded which salt melts ice the fastest, rock salt, healing salt, or table salt. In order to successfully complete this experiment, you need an ice tray of ice and the three different salts. You pour a teaspoon of each salt on a different ice cube and see how long each salt takes to melt the ice cube completely. As a result, rock salt took the shortest amount of time to melt the ice cube. It was come to a conclusion that, due to rock salt having calcium chloride and

sodium chloride, which both lower the freezing point of ice, listed in the ingredients, it melts ice the fastest.

318-03 And the best mouthwash for you is...

Andrey Kovalev

(Sullivan – Microbiology)

This experiment is designed to test which mouthwash is most effective in killing bacteria *Staphylococcus Epidermis* and *Escherichia Coli*. The mouthwashes that will be used are Tom's of Maine all-natural, alcohol-free mouthwash, Scope antibacterial mouthwash, Act fluoride mouthwash and Listerine antibacterial mouthwash. After sustaining a sterile environment using alcohol and a flaming torch, bacteria will be placed in agar plates. Then, disks containing the four different mouthwashes and one control disk (water) will be placed in the agar plates containing each type of bacteria. These plates will be sealed with Parafilm and will then be incubated at 37 degrees Celsius. Finally, zones of inhibitions will be measured and compared. After comparing the data and results, Scope mouthwash was most effective in killing both types of bacteria with an average of a 31.2 mm zone of inhibition. Then came Listerine with a 28.4 mm average of zone of inhibitions and Act and then Tom's of Maine followed up. The reason why Scope was the most effective mouthwash even though it only had 15% alcohol compared to 21.6% alcohol in Listerine is because it had a higher concentration of acids and salts including Benzoic Acid, Sodium Benzoate, and Cetylpyridinium Chloride which serve a similar function as alcohol, which is to penetrate the cell wall and disrupt and destroy cellular activities. This is also the reason why alcohol-free mouthwashes like Act and Tom's of Maine kill bacteria: because they contain these acids and salts that aid in killing bacteria.

318-16 Which has more Vitamin C, Fresh, Frozen, or Canned Foods?

William Lam

(Ross – Medicine)

I wanted to see if food labels that claim this or that amount of Vitamin C in them were really true. So I choose three common ways foods can be bought in a store and tested them. My foods were a peach and tomato that were canned, fresh and frozen as well as water as a control. From research I got a rough estimate of how much Vitamin C should be in a medium peach and tomato. Since the tomato naturally had more Vitamin C I knew overall it should have more Vitamin C than any of the peaches, but in terms of packaging, I hypothesized that the canned varieties of the foods would have the most Vitamin C. Since I could not find frozen peaches and tomatoes with a nutrient label on them in a store I decided to just take a regular fresh one and put them into the freezer for a whole day and allowed them to thaw two hours prior to testing. I cut into each one of peaches and tomatoes until a reasonable of juice spilled out, dipped my Vitamin C test strips into them and the water as well, recorded the results and did two more trails. In the end I found that the canned peaches and tomatoes had the most Vitamin C in their fields, the canned tomatoes had twenty-five milligrams of Vitamin C and the canned peaches had fifteen milligrams of Vitamin C.

318-14 How Safe is Your Drinking Water?

Gabrielle Langston

(Aubrey – Medicine)

Two of the main pipes that are used in our society are lead and PVC (polyvinyl chloride) pipes. Lead pipes are used for older houses while PVC pipes are used for newer houses. Unfortunately, people who live in older houses have a greater risk of getting lead poisoning by drinking tap water, because the lead from the lead pipes can get into the water more easily. PVC pipes however, are durable, hard to damage and long lasting; therefore, they are more commonly used today in water systems. The United States requires that the amount of lead in tap water to be no higher than 15 parts per billion (ppb.) Lead poisoning harms millions of people per year, so countries

worldwide still need to reduce the amount of lead in tap water. In this experiment, three old houses that were fifty years old (or more) and three new houses that were ten years old (or less) were visited. The houses were from all five boroughs, including New Jersey. At each of the houses, the tap water ran for thirty seconds before an eight ounce sample was taken in a bottle. After all the samples were collected, a lead testing kit was used to test the level of lead concentration. Overall, the average lead concentration was much higher in the older houses than in the newer houses. The average lead concentration for older houses was 21 ppb while the average concentration for newer houses was 9.7 ppb.

316-07 "Magnetized Water" and the Germination of Black Eyed Peas

Kevin Lee

(Aubrey – Plants)

The aim of this experiment was to determine if "magnetized water" affects the germination of black eyed peas. In crop areas where droughts often occur, water resources are greatly pressured. There have been some claims that "magnetized water" may have beneficial effects on the germination of seeds. If these claims were true, then we can reduce the total water used for irrigation of crops during droughts to save water. The methods involving "north magnetically treated", "south magnetically treated", and non-magnetically treated tap water were conducted in room temperature with ample sunlight. The magnet used for magnetic treatment of water was a neodymium block magnet. Five Black eyed peas were placed on each filter paper in each 6 Petri dishes separated into 3 groups of 2. Five milliliters of each type of water was given three times per week. Data would be recorded every three days. The data indicated that the "south magnetically treated" group had seven seeds that germinated. The "north magnetically treated" group had two seeds that germinated. The control group had one seed that germinated. The analysis of the data suggests that the magnetic treatment of water does affect the germination of black eyed peas and varies with the polarity of magnets.

316-04 Sugar, Spice and Everything Nice

Maggie Lei & Candy Nguyen

(McDonnell – Medicine)

If you thought spices were just for flavor and fragrance, you thought wrong. There is so much more to spices that you might not know. Believe it or not, spices have a special power: the power to kill bacteria. Not only do spices make your food taste and smell much better, but it makes your food healthier as well! However, not all spices have the same effectiveness against bacteria. Some spices work better than the others. And some don't work at all. So the big question is, which spice is more effective in killing Escherichia Coli?

319-14 Variations in Fingerprint Patterns based on Biological Relationship

Sarah-Lee Lewis

(McDonnell – Medicine)

While watching a criminal investigation program there was a case where identical twins were on trial because one twin had committed the crime and blamed it on his twin. Two forms of DNA were left on the crime scene- a hair follicle and a fingerprint. First, scientists tested the hair follicle and found it was inconclusive because identical twins have a very close DNA structure. Scientists then tested the fingerprint and they found the real criminal. This realization made me think about the question what is the variation in fingerprints between identical twins, fraternal twins, and siblings? Fingerprints are defined as an impression of the lines upon the fingertip taken for the purpose of identification. In cases such as identical twins where it impossible to identify one based on DNA, fingerprints play the important role of helping to discover who is who. The government uses fingerprints everyday to identify and classify people. To test this I placed the fingerprints on graph paper and analyzed how many boxes were the

same. This method helped to get numerical data in the experiment. I hypothesize that the closer two people are biologically the closer their fingerprint patterns would be. By doing this experiment I expect that identical twins will have the closest fingerprint pattern.

318-01 Meating Bacteria

Jiayi Li & Xiao Kuang

(Aubrey – Microbiology)

The objective of this study is to evaluate whether rare, medium, or well-done steak contains the most bacteria. Meat is one of the main diets in human beings. We are often told to cook the meat thoroughly. However, it is not the same in steak. According to research, Steak is only prone to be contaminated with the bacteria E coli on its outer layer. In fact, many people like to eat their steak rare. This study will supply us the knowledge whether rare steak is safe to consume. In this experiment, we set up two trials. We cut the steak into four equal sizes. We fried the steak at different times: rare (4 min) medium (8 min) and well-done (12 min). We cut the outer layer and obtained only the meat from the middle portion of the steak. Then we blended it fully until it turns into a solution. We performed a serial dilution of nine times. Then we took 0.1 ml of the solution from the 9th dilution and put it on an agar plate. Next, we waited for the agar plate to be incubated over night at 37 degree Celsius. Last but not least we count the bacteria by using the software called Image J.

319-02 Oh Snap!

Joan Li

(McDonnell – Products)

Many people don't realize the damage that they are inflicting on their hair when they do something unnatural to it. Natural hair is incredibly strong and this strength is called tensile strength. A single strand of hair can be as strong as a piece of copper wire that is its size! This strength can be severely weakened by chemicals applied to the hair. This experiment will test the damage that popular hair products will do to natural hair. Six different products will be applied to different colored hair to see which product damages hair the most compared to a piece of natural hair. One end of the hair will be tied to a device and the other end will be tied to a cup which is going to be added with skittles until the hair breaks. The results of this experiment showed that hair dye did the most damage to hair. This experiment also showed that longer hair will break more easily than shorter hair and blond hair was the weakest in the three hair colors tested. People should be more aware of how bad their hair can become and how damaged it can become if they don't take care of it carefully.

318-19 Disinfection of Contaminated Water

Michelle Li

(McDonnell – Chemistry)

The motivation of the project is to be able to produce low costs, which may benefit people in developing countries. The objective of the experiment is to test the effectiveness of a solar still to produce clean water. To test this objective, the experimenter used a bucket, a cup, a piece of wood, contaminated water and plastic wrap to form a solar still. This solar still will use solar energy to produce clean water. The results show that on a non-cloudy day approximately 14 mL of water will condense. This model can be used in developing countries, where the water is mainly polluted. This model has low costs and may increase health and sanitation in developing countries.

320-07 Salty Ice

Dong Hong Liang

(Aubrey – Chemistry)

Salt is used every year in the winter in order to melt ice at a quicker rate. Salt has properties that would increase the temperature of the melting point thus increasing the rate that the ice melts at. Prior experiments and research have shown that salt does make ice melt quicker. The rate is dependant on the amount of table salt used. The purpose of this experiment is to determine the optimal amount of salt needed to melt a given amount of ice. During this experiment, the initial weight of snow and salt was measured, then allowed to melt within a given time period.

314-06 Sleep Tight!

Jian Lin

(Aubrey – Physics)

A yo-yo is a fun toy that everyone has experienced before. Many have attempted yo-yo tricks and some might have failed. One trick is known as the sleeper. The sleeping time is when a yo-yo is spinning constantly at a fixed point at the bottom of the string. My project is about variables that will affect the length of the sleeping time of a yo-yo. I am trying to test different factors that may change the sleeping time. One factor I am testing is the length of the yo-yo string. I am setting up a controlled experiment. The constant is a full length yo-yo string released at 4 feet above ground. As the test goes on, the length of the yo-yo string will decrease. The other factor I am testing is the tightness of the axle between the two disks. The constant for this variable is a medium tight axle and being released at 4 feet above ground. I will see the relationship between the sleeping time and the tightness as it becomes tighter and looser. I will do each test 3 times for 3 different trails to make my experiment more accurate. The outcome of this experiment can be totally different from what I have hypothesized. Doing multiples trails can help improve the outcome. I believe that as the string length become longer, the sleeping time of the yo-yo will also increase. Also when the tighter the axle is, the sleeping time will become longer. Results has shown that when loosened, a yo-yo's sleeping time is about 9.7 seconds and when tightened, is may sleep for about 16.2 seconds

319-03 I scream, SUN SCREEN!

Joyce Lui & Emilee Yang

(Aubrey – Products)

Currently, skin cancer is one of the top cancers throughout the world. The importance of sunscreen is to prevent skin damage caused by prolonged activity under the sun. Skin cancers caused by the sun are on the rise due to the thinning of the ozone layer located in the stratosphere. This is due to human activities which include the burning of fossil fuels which emit harmful gases to the atmosphere. Applying sunscreen significantly decreases your chances of getting skin cancer by blocking harmful UV rays coming from the sun. Yet there are just so many brands out there to choose from. Sometimes "quantity does not mean quality," in terms of the SPF. Many claims sunscreens advocate are not true, some only 10% true. Knowing the correct brand to purchase can not only save you money but make what you buy worth it. In this experiment, different products of sunscreens will be tested. Two different brands of sunscreen, Burt's Bees and Walgreen's, will be tested, both with an SPF of 15. Strips of film will be submerged in the following sunscreens for approximately 30 minutes. You will proceed in bringing it outside on a sunny day for two hours. After two hours develop the strips in a dark room with a chemical called sodium thiosulfate. Place the strips against a light to observe your results. To compare the results, the film needs to be held up against the light to see the colors. The lightest colored film indicates that the type of sunscreen used was more effective. The lightness of the film is subjective, but a generalized comparison can be made between the two strips of film. The control which is the strip with no sunscreen obviously appeared quite dark. One of our products,

Burt's Bees has a unique composition with an active ingredient called titanium dioxide which is not common among all sunscreens.

319-20 Germinating Zinnia Seeds in Unusual Conditions

Diana Lum

(Ross – Plants)

Why do people water plants? Why do people use water to "water" plants? Why does no one use other types of beverages/solutions to water plants? This experiment will test whether different pH levels from various solutions will affect the germination of Zinnia seeds. The solutions used are water (pH 7), lemon juice (pH 2), Coca Cola (pH 2.6), household bleach (pH 11) and egg white (pH 8). Five Zinnia seeds are put into paper towels which are dampened with each solution and sealed in Ziploc bags. Water served as the control throughout the three trials that were completed for each group. The specimens were recorded daily and observed over the course of ten days. By the end of the tenth day, it was found that there was no plant germination in lemon juice, Coca Cola and household bleach although growth was apparent in egg white and water. At the end of the trials, the germination counts of the three trials were averaged. The averages were 0/15 for lemon juice, 0/15 for Coco Cola, 13/15 for water, 13/15 for egg white and 0/15 in bleach. The results proved that pH had had a significant effect on the plant germination of Zinnia seeds and supported that the seeds couldn't germinate under extreme pH conditions such as the bleach, lemon juice and also Coca Cola. While egg white and water had the same averaged seed germination count, stronger roots were evident in seeds that were grown with water.

319-18 The optimum amount of salt to melt snow

Carla Macias

(McDonnell – Environment)

Salt is a universal tool used by millions all year round to help with the removal of snow and ice. Most consumers use salt without paying attention to the amount they are actually using which could eventually become not only expensive but it could become a unnecessary over usage of salt. The question is, is there a certain amount of salt that can be used that will get the job done but at the same time save you money? This experiment was done to determine the optimum amount of salt that could be used on different amounts of snow. Different constant amounts of salts were tested on different amounts of snow to determine the optimum amount of salt that would be the most effective when melting all different quantities of snow. The results shown that there is a average optimum This determination will not only help consumers determine how much salt use but it will become economically and environmentally beneficial.

320-01 A Study of the Effect of Music on Concentration

Andrey Moiseyenko

(Sullivan – Behavior)

The purpose of this experiment was to determine the effect of 3 types of music on concentration. Hypothesis is that rock will result with best results because it will stimulate the body and brain to work faster and better. There are 4 trials, 3 for each type of music; rock, rap, classical and a control. The test subjects where 14 students of the research projects class. The procedure was simple and revolved around students completing a timed maze for each of the trials. Each of the mazes (3 in total) was randomly assigned, and each was the same difficulty and size. The same environment was maintained for everyone. The time it took to complete the music trials was half of the time to complete the control. My hypothesis was in part correct, because the upbeat tempo of the rap song helped the test subjects perform best.

318-18 Battle of the Batteries

Ian Morel

(McDonnell – Physics)

Everyday people are confronted with the choice between different brands of batteries such as Duracell and Energizer. The purpose of my experiment was to determine which type of battery is more efficient, Duracell or Energizer. I tested different types of these batteries (A, AA, C, D) in controlled objects for each and recorded their lasting times. Also I measured their respected voltages before and after and then recorded the percentage of voltage was lost. When comparing results I have concluded that all types of Duracell batteries lasted longer and lost more voltage during that period of time then all types of Energizer batteries. It is concluded that Duracell is the more efficient and superior battery. People will now no longer be confronted between the choice between the better battery.

319-17 The Phenomenon of Genetically Modified Organisms

Vivian Ng & Albert Murzakhanov

(Aubrey – Microbiology)

The objective is to use the process of genetic engineering to introduce a new species of Escherichia coli bacterium (one that is currently susceptible to ampicillin) by testing the effectiveness of implanting a pGLO gene making the Escherichia coli resistant to ampicillin. The process of genetic engineering and gene alteration consists of an innovative way of modifying the genes within an organism. The recent occurrence of bacterial resistance to antibiotics is due to the transmission of plasmids. pGLO is a plasmid which encodes the gene for GFP (Green Fluorescent Protein) and a gene for resistance to the antibiotic Ampicillin known as beta-lactamase. pGLO also incorporates a special gene regulation system, which can be used to control expression of the fluorescent protein in transformed cells. In genetic engineering, plasmids are used to introduce foreign genes into a bacterial cell. The pGLO gene will be inserted, and the Escherichia coli bacteria, will be monitored for the development of resistance to ampicillin. It is expected that the Escherichia coli which did not receive the pGLO plasmid or the ampicillin (control group/-pGLO), will experience full growth, and the bacteria which received the ampicillin but not the plasmid (control group/-pGLO), will have a high death rate; however the bacteria receive the pGLO plasmid not the ampicillin (experimental group/+pGLO), will experience full growth, while the bacteria receiving the plasmid and ampicillin (experimental group/+pGLO), is to have high death rate but also have some surviving colonies, which would have acquired resistance. A successful genetic transformation would allow current and future scientists to grasp a better understanding of the vital topic of Recombinant DNA technology.

320-19 Acid, Conductivity, and Electrolytes: Maintaining Your Body's Balance

Wei Ni

(McDonnell – Chemistry)

When you exercise heavily, you lose electrolytes in your sweat. Maintaining the right balance of electrolytes helps your body's blood chemistry, muscle action and other processes. My project was to find out the relationship between acid, conductivity, and electrolytes of different liquid substances. My hypothesis is that the more acidic the liquid substance are the better the conductivity it would be and has more electrolytes. The experiment is conducted by testing the acidity, conductivity, and how many electrolytes the ten different liquid substances has using a multimeter. My hypothesis was correct because the substance that is the most acidic has the best conductivity and most electrolytes. It also shown that is better to drink lemon juice, orange juice, etc. than sport drinks like Gatorade because they have more electrolytes and less chemicals and sugars.

319-06 Stressed Out From Salt

Zoha Noor

(Aubrey – Plants)

Salt stress can lead to oxidative stress in plant tissues and this causes cellular damage through oxidation of lipids, proteins and nucleic acids. To minimize the effects of this stress, plants have evolved an antioxidant system. Salt water affects the ability of a plant to take up essential nutrients. This causes nutritional imbalances in the plant, but not all plants have the same tolerance for salt. The purpose of this project is to determine the effect of different concentrations of salt on the germination of lettuce seeds. The idea behind this experiment is to see how the lettuce seeds will react to a type of environmental contaminant, which in this case is salt. The effects of six different levels of salinity, including the control, will be tested on lettuce seeds. To carry out the experiment, different concentrations of salt will be added to lettuce seeds. The seeds will be placed in Petri dishes, which will then be placed in an incubator for approximately five days. After the five days are up, the roots of the germinated lettuce seeds will be measured.

314-08 How Does Listening to Music Affect your Problem Solving Proficiency?

Naufa Nuha

(Ross – Behavior)

In this experiment, twenty high school students were tested to see how listening to familiar music affect the results of a ten question quiz based on logic and common education by high school. Their accuracy in answering the questions was also accounted for. 12 out of 20 people did better without music while 8 out of 20 people did better with music. The data is inconclusive because the results were very close

319-13 Electrolyte Competition: Orange Juices vs. Sport Drinks

Emily Pan

(Ross – Products)

Exercisers' bodies usually dehydrate from a long exercise. From a local store, there are many beverages to choose, including orange juices and sport drinks. However, which kind to get? For a body to maintain the amount of water in the body, electrolytes need to be replaced since it's reduced by the work out. "It is important for the balance of electrolytes in your body to be maintained, because they affect the amount of water in your body, blood pH, muscle action, and other important processes" (Dugdale, 2009). To determine whether orange juice or sport drinks have greater amount of electrolytes or conductance, a digital multimeter is needed. It measures the resistance or each drink. The equation used was $G=1/R$ where G is the conductance and R is the resistance. The control group was distilled water. The constant groups were diameter between the probes and depths of the probes in glass beaker. Certain sport drinks will have more electrolytes overall than certain orange juices. After three trials of each drink, the experimented sport drinks had the most electrolytes and also the most source of error so it lowers the number of electrolytes. This means the orange juices that were tested can have the most electrolytes since it had less source of error. One source of error could be the temperature varies for each drink since it was tested one after another but the test probes were cleaned for every trial.

314-21 The Effect of Temperature on Lipase Enzymatic Activity

Sana Parvaz

(Aubrey – Cellular)

Many people especially those with gall bladder insufficiency, or who have had their gall bladder removed have difficulty digesting fats and oils. This is because they lack the bile salts needed for efficient digestion. Therefore, lipase is unable to break- down these substances. Which completely deprives the individual of many healthy benefits gained from the ingestion of fats and oils. Furthermore, powdered lipase will be placed in

several test tubes containing oil and water, with the exception of a control no bile will be present. The mixtures will be heated to various pre-determined temperatures and observations will be made to see if lipid break-down has taken place at the specific temperatures. Through this experiment, the investigator will be able to determine if temperature evaluation of lipase taken (orally or by injections) will be able to break down or digest fats and oils without the need to emulsify them with bile salts.

320-14 Grass: How Much Water Does it Really Need?

Clifford Philogene

(Ross – Environment)

319-09 Is there a difference between detergents with enzymes and without ?

Latisha Pollard

(McDonnell – Products)

Many detergents now include enzymes in it. Seeing the many commercials on detergents and my problems with removing various stains motivated me to do this project. Many people who do laundry would benefit from my findings because it would help them make the right choice on detergents and would help them save money. The researcher would test one detergent with enzymes and one detergent without enzymes on different stains to see how efficient they are. As a result of doing this, the researcher found that detergents with enzymes are more effective than those without enzymes. Therefore, people should be using detergents with enzymes because it would be more beneficial.

318-09 The Dynamic Effects of Distance on Potatoes and Plant Growth

Faiyaz Rahman

(Ross – Plants)

This project is about the ways how the distances in which potatoes are grown affect its growth. This is an important topic to research about because this research can potentially enable scientists to consider the distances as another crucial variable which may affect their experiments when dealing with plant growth in the future. This idea of plant growth and the effect of distance were tested through a series of data collected after growing potatoes in different distances (starting with 12 inches and then each progressing row was grown 4 inches away from the preceding row). All the growing conditions were kept the same and this experiment was conducted three times to ensure reliable results. As a result of completing the experiment, the distance in which plants are grown away from each other do affect the outcome of their final growths. Although the actual numbers weren't that high in numerical value, in terms of the growth of plants, this was a significant difference after conducting t-tests (which revealed over 98% confidence level). The final results indicate that the final growth of potatoes are affected by the distances in which they are grown away from each other and this should be a another variable while experimenting with plants.

314-02 Fingerprint Identification

Gazi Rahman

(McDonnell – Cellular)

What are fingerprints? The pattern on the ridges of your finger are your fingerprints. They are permanent imprints on your finger that do not change overtime. Fingerprints are used for identification, like for police investigation for forensics. The basic three categories that fingerprints are based on are the loop, whorl, and the arch. My experiment tests each finger to see if they identical on each finger. A person's hands are identical to each other but opposites fingerprints. Fingerprints are determined by your DNA and they are inherited by your parents that determine your personal characteristics and traits. The process of gestation helps create the ridges on the epidermis which is the outer most layer on your finger. Even though the exact number,

shape, and the spacing on the ridges are the same it differentiates from person to person.

318-12 Which environments affect the rates of mold growth?

Tinecia Ramdass

(Ross – Environment)

The environment in which foods are placed effect they rates which mold grow on them. For this experiment, four types of foods were used, bread, strawberries, cheese, and meat. The environmental conditions were altered and the amounts of moisture added were altered. The two environments were room temperature vs. refrigerated. Each of the foods was placed in each environment in Ziploc bags. One of the two bags had extra moisture added to it. This moisture increased the rate that the mold grew. Day after day, the foods were viewed and examined. Notes were taken on which foods developed mold on what day. According to the hypothesis, strawberries would form mold first, then meat, cheese then bread. This was just an educated theory. The results proved this hypothesis correct. The strawberries developed mold around the 4th day. This was very quick. The bread developed mold the slowest. The first sign of mold was recorded on the 10th day. These results proved and supported the fact that temperature, and moisture strongly affect the rates in which mold grows. Mold is best grown in warm environments filled with moisture. This type of environment surrounds us in our everyday lives.

319-08 To Dye for Hair

Taylor Ramos

(Ross – Products)

This research experiment is called To dye for hair because the purpose of the experiment is to product test three different hair dyes to see which one lasts the longest after a certain amount of washes. To simplify, the goal is to see which hair dye is the best. The 3 hair dye brands I used were Revlon, Clairol and Dark and Lovely all of them being the same shade of black. My hypothesis is that the Revlon will stay in the longest without fading. As for the procedure I used dark blonde hair that was straight, to dye. Each dye had the same length and width of hair dyed with the same amount of each hair dye used. All 3 samples of hair were all turned successfully black and after were washed 40 times with Garnier shampoo. The results were that none of the dyes came out of the dyed strands of hair. In conclusion my hypothesis was incorrect, the Revlon did not fade, but the other dyes did not fade from their samples either. My sources of error was the way I washed the hair at some times more scrubbing occurred than at other times. The reason my experiment might not have worked were the differences between the hair usually dyed with these products and the hair that came from packaging the have chemicals while our hair has oils and proteins from our scalp.

320-02 Ready, Set, Apply: Take Action Against Dandruff

Faryal Razzaq & Sadia Nusrat

(Ross – Products)

There are several problems associated with the condition of dandruff caused by the bacteria *Pityrosporum ovale*. People would want to turn to the most efficient solution to controlling, managing or possibly eliminating dandruff. There are several products that claim to fight dandruff to a certain extent. We went ahead and tested to see which one of the store brand shampoos consisting of Head and Shoulders, Selsun Blue, Neutrogena T/Gel and Nizoral 1% would be the best in fighting dandruff. We hypothesized before the experiment that Nizoral 1% would work the best according the results published in previous studies. We tested their anti-dandruff properties measuring their inhibition zones in the Petri dishes 24 hours after we had placed them as small disks of filter paper on the bacteria *S. epidermidis*, a skin bacteria related to the dandruff causing bacteria *Pityrosporum ovale*. Also, we tried to compare the effects of the home remedies in killing *S. epidermidis*. From the remedies ginger, apple cider

vinegar, watermelon/milk and honey that we used, we hypothesized apple cider vinegar to work the best due to its property of balancing the pH on the infected scalp and preventing cells from dying and flaking off. From the results, our hypothesis wasn't supported for our prediction for the behavior of the store brand shampoos as Nizoral 1% actually was the least effective and Head and Shoulders the most effective followed by Selsun Blue and T/Gel. From the home remedies, apple cider vinegar tied in with ginger.

320-04 You Don't See Me But I Cu

Natalya Romanyak

(Aubrey – Chemistry)

When you go to get a drink of water from the school water fountain you rarely think about what is in the water you are drinking, its water, it quenches your thirst and that's it. However there is copper present in that water. A small amount of copper is necessary for humans daily to stay healthy however if too much copper is present it can lead to intestinal problems. If the concentration of copper exceeds 1.0 mg/L it is considered unhealthy. This experiment is important because it provides people with knowledge of how much copper is present in the water at different times of day and this allows them to determine whether they still want to drink the water from the water fountains. To test the concentration of water in a specific water fountain all water samples must be first draw samples, meaning that the first water that comes out of the fountain not after it has run for some time. Bottled water is used as the control and a test tube is filled with sample water from the water bottle. The indicator Copper A is added to the test tube and the contents are mixed and then the indicator Copper B is added to the test tube and the contents are mixed. After three minutes the color should fully develop and in order to determine the accurate color hold the test tube so the bottom is $\frac{1}{8}$ inch above the white area of the color chart. Match the color by looking down into the test tube and determine the concentration. This is repeated for five days in the morning and afternoon however with water from a water fountain on the first, second, third, and fourth floor. The presence of copper in water is due to copper pipes. If water is dormant for several hours when it is first allowed to run it will contain a higher concentration of copper than if the water has run for an extended period of time.

320-10 Soil in Brooklyn: Fuggedaboutit!

Samuel Rubinstein & Joey Wu

(Sullivan – Earth)

Soil is a mixture of minerals, living organisms, and bio-degradable organisms. Soil is found in many different environments, especially in Brooklyn. 3 experiments were performed on the soil collected from the different neighborhoods to see how different each soil was. First, the water retention rate was tested. This showed how much water each soil can hold. Second was the density test. This showed if the soil were placed in water, whether it would float or not. Third was the pH test. This test showed if the soil was suitable for plants to grow in. Our hypothesis was that the soil with greatest water retention rate will have the larger density, and the more neutral pH. As a result, the soil from Bedford had the greatest water retention rate, but it had the 4th highest density rate, and it had the most acidic pH. In the end, our hypothesis was incorrect.

314-15 Electrifying Beverages

Aisha Saeed

(McDonnell – Chemistry)

The purpose of this experiment is to find out how popular brands of sport drinks that contain electrolytes compare to everyday drinks found at home. My hypothesis is that popular brands of sport drinks will contain greater amounts of electrolytes than when compared to everyday household drinks. I decided to do this project to found out whether or not there is a cheaper alternative to expensive sport drinks and to see if you can make your own drink enhanced with electrolytes for half the price or less. In order

to find the amount of electrolytes in an energy drink, I used a GLX. Using a conductivity probe, I dip the end of the probe in a flask containing the sport drink being tested. Using the data collected so far, PowerAde Orange contains the most electrolytes. PowerAde Mountain Berry Burst had 2764 μ S/cm, PowerAde Orange had 2856 μ S/cm, and PowerAde Fruit Punch had 2847 μ S/cm. Using the data achieved so far, one can conclude that flavor of the sport drink also plays a role in the amount of electrolytes found. Just because the brand of the drink is the same does not mean that all the drinks from that brand have the same amount of electrolytes, there are different amounts of electrolytes in different flavors. Out of all the household drinks tested orange juice seem to have the most amount of electrolytes.

320-06 Affect of Drinks on the Enamel

David Shmidt

(McDonnell – Medicine)

Since the 1970's soft drinks and other harmful liquids have been steadily eroding the enamel of teeth. The purpose of this experiment was to see which liquids had the greatest affect on the erosion of teeth. Doing this experiment would help us know which liquids to drink sparingly. This would be done getting 8 different egg shells (material most closely related to the enamel of the tooth) and drenching them in 7 different liquids starting with the lowest pH of 2.5 (Coca-Cola) to a pH of 7 (Water) and keeping one in a constant environment. The weight of the egg shells will be taken before and after the experiment. The liquid that created the greatest loss in enamel would be the worst for the teeth. Research will also help find the results of this experiment. Coca-Cola had the worst affect on the egg shell as 19% of the shell was lost and the one kept in water was the least harmful as no shell was lost. After conducting this experiment it is valid to say that Coca-Cola should be drank in moderations!

319-01 pH Level Dilemma

Saba Siddiqi

(Sullivan – Plants)

The purpose of my experiment was to find the pH level that kidney beans grow best in. Just like us humans like to live in suitable conditions, so do seeds. If you are interested in plants or grow them frequently, it is important to know the pH level they like to grow in. Farmers and agriculturists especially need to know the best pH levels for plants as that will depend on how much crops they will get. If the seeds are not kept in the right pH level, some nutrients will become insoluble and the seed will not be able to obtain enough essential nutrients in order to grow. I tested the pH environments of hydrochloric acid, for an acidic environment, sodium hydroxide, for a basic environment and distilled water, for the neutral pH environment. I germinated the kidney beans in these environments to see which surrounding would allow the beans to grow the most. After a week of germination, I discovered through my results that the seeds grew the most in water, with a 27.68 g increase in weight and 16.4 cm increase in length. This concludes that kidney beans grow best in a neutral pH environment. However, fungus grew on most of the seeds that I was testing, so the weight and length of the fungus was also taken, which might have had made my results inaccurate. I rinsed the beans in a diluted solution of bleach to prevent this but the fungus grew anyway.

318-08 Preserving With Preservatives

Leroy Sin

(Ross – Chemistry)

Keeping food fresh is a very important matter in everyone's daily life. Today, there are various methods that people use to preserve their foods. In most foods, chemical preservatives are used to help them last longer in storage. Some older, more traditional ways of preserving include methods such as freezing, drying, smoking, pickling, canning, or some other means. In this experiment, chemical preservatives in daily foods,

like meat, are going to be tested to see if they really last longer than meat without chemical preservatives. The problem for this experiment was: Do foods containing preservatives really stay fresh longer than foods without them? It was hypothesized that foods with preservatives would stay fresh longer than foods without it. In the experiment, paper plates were set out and the meat (sausage and ham) were placed onto the plates. One plate had the one with preservatives and the other place had the one without. The control group for both was stored regularly in the refrigerator. The experimental plates were left in a room with room temperature for 10 days. Observations of their changes were recorded every 2 days. The results were that the two didn't have much difference between each other. Both the one with and without preservatives had very similar characteristics such as texture, appearance and color. These results proved my hypothesis wrong, since one of them didn't outlast the other, but instead, they were on the same level of spoilage.

314-07 Reaching Temperature Equilibrium When Merging A Hot and Cold Water

Hosni Sirhanshiraji & Ken Han Chiu

(Sullivan – Chemistry)

The experiment conducted is meant to see if a larger ratio between a hot and cold water source, in this case will be fresh water will affect the time it takes to reach equilibrium temperature when mixed in equal amounts. After analyzing the goal of the experiment and taking into consideration the characteristics of water, a hypothesis is claimed that a greater ratio will lead to a longer time to reach equilibrium temperature. The equilibrium temperature chosen in the experiment is room temperature along with standard pressure because twenty- five degrees Celsius seemed most suitable due to the environment of where the trials will actually be done. Using intervals of three degrees greater and lower than room temperature, five trials are done at eight different ratios and averages are taken from all five trials from each ratio testing. Overall after all the trials are done and the data is collected, it is clearly shown that the smaller ratio between a mixture of hot and cold water source when mixed will reach equilibrium temperature at a much greater rate than a larger given ratio. The hypothesis is discovered to have been proven correct due to the results of the experiment supporting the claimed educational guess.

316-21 Salt-ubility

Stephanie Situ

(Aubrey – Chemistry)

Many essential chemical reactions and natural biochemical processes occur in liquid solutions, so understanding the chemical properties of liquid solutions is important. This experiment is intended to investigate how much of each of the following three substances can dissolve in water: ordinary table salt (NaCl), Epsom salts (MgSO₄), and sugar (sucrose, C₁₂H₂₂O₁₁). When a mixture is homogeneous and when its components are dispersed evenly, it is said to be a solution. There many different types of solutions, that can be separated according to the three states of matter (solid, liquid, or gas). Water is one common solvent that can be used to dissolve many different substances. For this reason, many solutions are known as aqueous solutions because it is able to dissolve in water. As a result, water is known as a universal solvent. Solutions form when the force of attraction between solute and solvent is greater than the force of attraction between the particles in the solute. Furthermore, solutions exhibit some interesting properties. Normally, when we think of the freezing point of water, 0 °C comes to mind. However, tap water does not freeze at exactly this temperature because one, it is pure water and two, because it contains dissolved solutes. Another interesting property can be found through cooking. For example, will adding more salt to the pot of water cook eggs faster? Certainly, it can be concluded that the boiling point of a solution can be affected by the addition of a solute. These two properties, known as freezing point elevation and boiling point depressions, are called colligative properties.

319-10 Canned or Frozen?

Ksenia Slesareva

(Aubrey – Chemistry)

Which have more calories, canned vegetables or frozen vegetables? Whichever has more calories gives more energy since calories are just a measure of the amount of energy a food contains. I tested which have more calories, canned or frozen peas. In this experiment, I made a calorimeter. I did this by obtaining two different sized tin cans and drilling holes in them to place them through a metal rod. I placed the smaller can inside the larger can. Then, I placed a cork with a wire sticking through it and placing the frozen and canned peas on the wire. I then burned them until they have fully burned out. Then, I plugged my information into a formula to calculate the calories of the frozen and canned peas to see which peas have more calories, canned or frozen. In previous research, it has been shown that frozen peas will have more calories than canned peas because the calories get stored when they freeze while the canned peas have calories that get absorbed by the liquid that they are in.

320-20 Which Reliever Can Fight This Fever

Jennifer Snetkoff

(Aubrey – Chemistry)

The purpose of this experiment was to determine the dissolution time of three different fever reducing pills. My project is significant to society because of the claims made by commercials that certain medications can give "fast relief." For my experiment, I dissolved three fever-reducing pills such as Advil, Aspirin, and Tylenol. I dissolved these pills in simulated stomach acid, which has a 0.1 M concentration of Hydrochloric acid at a temperature of 37.7 degrees Celsius. Then, I timed how long it took for the fever reducing pills to dissolve in the simulated stomach acid. The purpose of the Hydrochloric acid resembles the acid found in a human stomach since the major components of gastric juices are mucus, pepsin, and hydrochloric acid. Gastric juices are liquids found in the stomach. These liquids are usually clear in color. The juices in the stomach begin the process of breaking down food so that nutrients can be extracted by the intestines. Then, they are produced by glands in the stomach as needed. The pH balance of gastric juices is very acidic. The information provided by this experiment might hopefully have the potential to aid a person when choosing the right medicine to help them get rid of a fever faster.

316-03 Which solvent is most effective in removing permanent marker?

Aiman Syed

(McDonnell – Products)

The purpose of this experiment was to find out which solvent is most effective in removing permanent marker. This research will help to provide a solution to a basic problem: What do you do when you want to remove permanent marker? The procedure involved testing 12 different types of solvents on a plastic frame with graph paper. Six of these solvents were common household cleaning products (ex. Windex), and 6 were unknown (not usually used to clean surfaces, ex. milk). This experimental procedure was performed 3 times in order to get a strong average of all trials. The results of the data resolved that rubbing alcohol and nail polish remover were both able to remove the most permanent marker. The data also concluded that many unknowns and tap water were not able to remove any of the permanent marker stains. In conclusion, rubbing alcohol and nail polish remover were the most effective in removing permanent marker. The fact that alcohol can dissolve both polar and non-polar substances and that nail polish remover contains acetone, was the main reason as to why these results occurred.

320-03 Environment Conditions on Fingerprints

Annie Tam

(Aubrey – Environment)

Fingerprints can be found everywhere you go. All fingerprints are unique in their own ways. When you touch something you leave behind your fingerprints and they stay on the object and when moved they travel on the object to different environments. Do fingerprints change over time in different environments after they were left behind? I used Vaseline to make fingerprints on a glass plates. Leaving those plates in different environments, untouched and checking up on the prints every two days. If we were to leave them in these environments untouched there shouldn't be any changes done.

319-16 Evaluate Saturation In Cooking Oils

Joanne Tan

(Aubrey – Chemistry)

For better health, cooking oils that contain higher amounts of unsaturated fats are recommended over those that are higher in saturated fats. Which cooking oil are you using at home, the healthy ones or the unhealthy ones? In this experiment, six different cooking oils will be evaluated according to their level of unsaturated fats. By using tincture of iodine, the amount of unsaturated fats in oil can be determined. Having equal amounts of cooking oils in test tubes and submerging them halfway under water, drops of iodine will be added accordingly to each test tube of cooking oils. The oils will be stirred with each drop of iodine, and if the oil changes to a purplish color, then stop adding the iodine. The more drops of iodine is used to change the color of each oil shows that it has a higher level of unsaturated fats.

316-01 Got Milk?

Janice Tran & Aya Itani

(Ross – Products)

Milk is known to be one of the most nutritious foods because it provides a sufficient amount of minerals and vitamins. Protein from milk is essential for the growth of bones and teeth. It can also strengthen teeth and bones and prevent it from being fragile. It has been shown in a number of studies that there are many positive affects that come along with drinking a good amount of milk especially during the teen age years. This is why this project is significant. In this project the rate of spoilage of different types of milk will be tested. Different types of milk will be used; 2% skim milk, whole milk, and fat free milk. Two variables are being tested; which milk spoils faster after being opened daily, and do closed containers spoil slower than the opened ones. Four pints of each milk type was used to conduct this experiment that lasted 16 days. Whole milk was labeled A, B, C, and D; fat free milk was labeled E, F, G, and H; and 2% skim milk was labeled I, J, K, and L. The pints were broken up into sets of three with the starting set being A, E, and I. D, H, and L were left in the refrigerator till the day after the experiment was over. The smell test was used to rate the milk in a scale from 1 to 3(1 being bad and 3 being good). After analyzing the results, it was found out that the data did not support the hypothesis. We thought that the whole milk will spoil due to its larger content of fat. But the whole milk did not spoil faster than the fat free and 2% skim milk; it was actually the fat free and the 2% skim milk that managed to spoil first.

318-10 Do beans grow at different rates when given different fertilizers?

Shirley Tran & Sonia Sharmin

(Sullivan – Plants)

We conducted an experiment to test how the fertilizer affects the rate of the growth of the seeds. This was done by adding the same amount of fertilizer to each seed: roman beans, black eye pea beans, and the red kidney beans. We used orchid fertilizer, rose food fertilizer, all purpose fertilizer and bloom buster fertilizer. We tested the beans for 5 days to see which fertilizer would work best for the most roots, longest roots, and had

the most growth. Then we recorded all the data and on the 5th day the number of the roots and measurements of the roots were taken for each bean. However the mass of roman beans, black eye pea beans, and the red kidney beans were taken. In conclusion, two of my hypothesis was correct since I predicted the black eye peas would grow the most and have the most seeds with roots. While my third hypothesis was incorrect since the kidney beans didn't have the longest roots because the black eyed peas also have the longest roots since they grew the most.

318-15 What is the "brightest" way of absorbing solar energy?

Mark Trosman

(McDonnell – Environment)

In this project, different solar thermal panel shapes will be tested to see which design can absorb the most solar energy over a specific amount of time, for the purpose of discovering a less expensive way to collect solar energy with the use of a new solar panel shape. Solar thermal panels would be built with various panel shapes (flat, wave-like, and dome). Each solar collector/panel would be made of aluminum foil and attached to a container, with water inside. The aluminum foil would have its dull side (less reflective) pointed outwards toward the sun in order to absorb more heat than the side with more shine, which reflects more light. The aluminum foil would absorb solar energy and the heat would be passed directly to the water from the air inside the containers. This water would be heated over time. Several trials of this procedure have shown that the flat solar thermal panel shape absorbs more heat than the wavy and dome shapes. However, this project can be revised to be a more professional experiment, with less possible errors because it can, in fact, produce findings that solve global energy problems, if done with other possible panel shapes and with a more organized method.

318-02 The Attack of the Waves!

Christina Tsoi

(Ross – Plants)

This science fair project is to find out whether or not higher concentration of RF radiation will have a positive or negative affect on plant growth. RF waves or Radio frequency waves, is basically a form of electromagnetic energy that has waves of electric and magnetic energy moving together at the speed of light. RF waves are part of an electromagnetic spectrum that contains all forms of electromagnetic energy. To measure the frequency of RF waves, they are measured in a unit called, hertz. A hertz is basically is equal to one cycle per a second. RF waves measure a frequency of 3 kilohertz to 300 gigahertz. Radio Frequency waves are used mostly in our everyday lives by providing telecommunications services. RF waves have been known to be harmful if exposed to a lot of it. The result from this exposure is caused by the heating of the tissue by the RF energy. In this experiment, RF waves were tested to see whether or not if affected the growth and quality of the lentil plant. So basically there are three groups that are set up each with 130 lentil seeds. They each are given 50 mL of water everyday and covered up with the same amount of paper towel in each group and are placed in their designated areas with same amount of lighting, and water.

318-05 Hurricane Warning - Relax

Joshua Wadler

(Aubrey – Environment)

This experiment was done to see if an increase in Earth's average temperature has led to an increase in storm intensity. In the experiment, every land falling hurricane from 1930 to 2000 was collected. The data recorded for the hurricane was its maximum wind speed (knots) and its lowest pressure (millibars). The hurricanes that were selected were only the ones that had made contact with land. This is because the first successful weather satellite was not launched until 1960. Therefore, it was impossible to detect all hurricanes that never hit land. If the hurricanes that hit land were acquired, the data

would have been unreliable. The averages of maximum wind speed and minimum pressure were taken from all of the hurricanes that hit land. They were then broken down into two groups, pre 1970 and post 1970. The year the Earth's global temperature started to increase was 1970. The results of the averages show that the wind speed is lower post 1970 than the wind speed of pre 1970. The pressure is lower post 1970 also than pre global warming. A t-test was done to see if there was a significant difference between the wind speed and pressure of pre 1970 and post 1970. The t-test concluded that global warming has not made any significant effect on wind speed or pressure of hurricanes. Thus, global warming has not made global warming stronger.

314-16 Experimenting With Water Wheel Paddle Angles to Generate Energy

Karen Hui Wang & Nicole Almaraz (Sullivan – Physics)

This experiment involved testing different angle paddles of a waterwheel to determine which angle generated the most power. Three angles were tested: 45 degrees, 90 degrees, and 135 degrees. These angles were increments of 45. Constructing the water wheel was the first step in the process. Other materials were needed such as a pulley, a metal clamp, and a string with a mass attached to it. We used a hose to shoot water into the water wheel buckets and thus making it rotate. The experiment discusses the power generated with the three angles. Results showed the 135 degree angle generated the most energy.

314-18 How will Different Solutions Impact the Lifespan of a Bubble?

Hai Yan (Ann) Wen (Ross – Chemistry)

Bubbles are fun but they only last for a few seconds once they come into contact with any objects or flat surfaces. In this experiment, store-bought solution will be compared and tested with four other homemade bubble solutions in competition for the best and longest-lasting bubbles. The four homemade solutions will be (1) Water & Detergent (2) Water, Detergent, & Sugar (3) Water, Detergent, & Glycerin (4) Water, Detergent, & Corn Syrup. Twenty trials will be done for the best outcome.

314-20 Growing Plants in Space?

Megan Wong (Aubrey – Plants)

Scientists have been studying hydroponics, the cultivation of plants in nutrient solution instead of soil, to discover new ways to grow food in space for missions beyond two weeks. The purpose of this experiment is to find if radish seeds grow faster in a hydroponic system or in traditional soil or with water and air combined. This is important because growing food in a hydroponic system may be able to produce a sufficient amount of food, so that it can be enforced in space. According to NASA, researchers and plant physiologists have grown radishes, green onions, and basil inside closed plant chambers at the Kennedy Space Center. The researcher, Angela Beaman, has also found out that basil grows very fast under different levels of light in a hydroponic system. In this experiment, I compared the germination rates of radish seeds grown in three different environments. They were grown in traditional soil, hydroponic solution, which contains all the nutrients a plant needs, and water and air combined. Two cups are used to grow the seeds in each type of environment to produce accurate results. Holes must be made on the bottom of the cups that contain soil to allow drainage. When the seeds start to germinate, count the number of seeds germinated in each system and measure the length of the radicle, which is the first part that occurs during germination. Measure the height of the stem after the seeds are germinated in each system.

314-10 A Cure to Stains

Raymond Wu & Tim Chak

(Sullivan – Products)

Ever had a stain on your favorite piece of clothing? Your first reaction is washing it with water? This project will show you the wonders of stain removers and which brand is worth buying! Why spend all that time scrubbing in the tub when you can spray stain removers on it in a matter of seconds. To get things started we have chosen three different types of stain removers which are Shout, La's Totally Awesome, and Spray N Wash. Our hypothesis was that Shout will clean stains better due to the rating of the product. We tested these products by using different types of stains. By having a control group we are able to collect data and come to a conclusion. The results we got showed that Shout did a better job at removing the stains while the others lacked behind. La's Totally Awesome spray also left a yellow stain surrounding the stains we have used. This experiment us by concluding that Shout is a great source to remove stains and to show everyone that the product does work better! It proves that our hypothesis that Shout does clean better and the ratings are legit.

314-01 There's No Need to Fear, Garlic is Here!

Amanda Ye & Jacinda Zhou

(Sullivan – Microbiology)

Garlic is a natural remedy used in one's daily life. It is known to be effective in preventing bacterial growth due to the presence of an antibiotic called allicin. However, the general public is not aware of which phase of the garlic is most effect in performing this task. This introduces one major dilemma that is to be solved during this experiment. Along with this problem, it proposed a further question to whether garlic, in its most effective form, is more successful on gram-positive or gram-negative bacteria. For the first half of this experiment, raw garlic is used to test for its effectiveness on the Staphylococcus Epidermis and E. coli bacteria. For second half, cooked garlic was used to test for its effectiveness on the same two bacteria. According to the data, Staphylococcus treated with raw garlic grew a total of 4.7 cm in a period of 7 days. Staphylococcus treated with cooked garlic grew a total of 8.8 cm in the time period. With the E. coli treated with raw garlic, there was a total of 7.0 cm bacterial growth. Lastly, the E. coli treated with cooked garlic had a total of 8.8 cm bacterial growth. From the results attained, the raw phase revealed the greatest potential in preventing bacterial growth. Furthermore, it can be stated that this phase is most efficient in the gram-positive bacteria: Staphylococcus Epidermis.

319-11 The Elimination of Serratia marcescens

Jenny Yeung

(Ross – Products)

What is the occasional pink stuff in your toilet bowl, shower stalls or bathroom tiles? that stuff is called Serratia marcescens bacteria. Many disinfectant products out on today's market have claimed to eliminate 99.9 percent of all bacteria. However, there are always two sides to every story. In recent years, the presence of Serratia has appeared more frequently in homes and thus, hospitalizing many Americans. Is that 0.1 percent of bacteria doing all the damage? Or is it just that some disinfectant products are not doing their job right? In this project, 3 products (bleach, Mr. Clean, and Scum X) are tested. A sample of Serratia was put onto a Petri dish, and so was filter paper discs soaked with a particular disinfectant product. The dish was then incubated at twenty five degrees Celsius for twenty four hours. Zones on inhibition are observed, measured, and averaged. Scum X came in last, only eliminated 0.5 mm of Bacteria on average. Meanwhile, bleach had proved its name and eliminated 4.8 mm of bacteria on average. Mr. Clean came in between, eliminating 3.2 mm of bacteria on average. what do these numbers mean? If a disinfectant product on the shelve fails to eliminate the simplest form of bacteria found in bathrooms, imagine what is left behind.

318-17 Toxic Chemicals Turned Harmless?

Michael Yip & Ricky Lok

(Ross – Biochemistry)

As it is well known, Hydrogen peroxide is classified as a toxin that can be harmful to living things. Performing this experiment, it is possible to test how fast hydrogen peroxide can be broken down into more simple compounds using a catalyst. These catalysts can be found in most root vegetables such as onions, garlic, and potato. Also, a more specified catalyst found in organisms that can produce their own catalyst, enzymes from pork and chicken liver can be used in this experiment. By testing how fast each types of catalyst solutions can decompose the hydrogen peroxide, one can find out the most effective organism that can turn this harmful chemical into just water and oxygen.

320-05 Which brand of batteries are the best and which environment is best

Daniel Zairi

(McDonnell – Products)

This experiment is based on what batteries are best for consumers. Famous brands or generic bands? Is Duracell better than Energizer? Are those two brands better than a Wal-Mart or Duane Reade generic batteries. By finding this out, consumers will be saving money and not buying insufficient batteries. In the process of testing these batteries, I will be simultaneously testing which environment is best for batteries. Should we store batteries in a cold, sunlit, dark, or moist environment? By finding this out, people will be able to spend less money on batteries and will be able to conserve energy sufficiently.

314-05 Caffeinated Plants: Get High or Die?

Andy Zhang

(Aubrey – Plants)

Many botanists have found numerous ways to increase agricultural production, by enhancing the growth of crops. Botanists have discovered that different types of soil affects the growth of different types of plants in different ways. Amount of water, amount of sunlight, different fertilizers and different environments are all factors that affect agricultural production. In this experiment, different amounts of caffeine would be tested on 11 plants of string beans. One of those 11 plants would be the control, which would receive no caffeine, except for 23.64 mL of water. Caffeine has been said and has been proven to be beneficial to plants. However, at what amount of caffeine provided to a plant would provide the maximum plant growth for a plant? By finding out that certain amount of caffeine producers could grow better plants at faster rates. The caffeine used in the experiment will come from pure caffeine pills. Completely extracted caffeine from drinks would be a difficult task. Two plants would receive 100 mg of caffeine. Two plants would receive 50 mg of caffeine. Two plants would receive 25 mg of caffeine. Two plants would receive 75 mg of caffeine. Two plants would receive 125 mg of caffeine. The amount of caffeine provided to the plants would be provided in with a mixture of 23.64 mL of water. The caffeine would be provided daily. The plants would be measured every two days. The effect of caffeine on growth rate would be change in height divided by time.

320-13 Effectiveness of different sunblocks against UV rays

David Zhang

(McDonnell – Environment)

This project is to find the effectiveness of different sunblocks against UV ray. This project can help the life of people by protecting them against UV rays, which causes multiple of damages to the human body (EPA, 2010). To test this, the researcher uses UV beads that changes color after being affected by UV rays. Those beads are placed into different plastic bag (Ziploc bag), each bag is coated with a different SPF. To do this

project you need to time the change from colorless beads to colorful bead. As a result I would expect that the sunblock with the highest SPF would be the most effective compared to other sunblocks.

316-06 Which kind of heartburn medicine is best at relieving heartburn?

Heng Zhang

(Ross – Products)

My experiment is about which kind of heartburn medicine is best at relieving heartburn, since heartburn is everyday experience for some or most people, knowing which kind of heartburn medicine work the best will become handy. Heartburn was a symptom of gastro esophageal reflux disease, also known as GERD. It when your lower esophageal sphincter muscle opens too wide, causing acid to flow back to esophagus. It usually cause by eating spicy food, eating an over portion meal, and by lying down after eating. I did an experiment of titration between heartburn medicine and stomach acid which is made up of diluted 1.0M HCl and the heartburn medicine I use is TUMS, Omeprazole, and Nexium. My hypothesis that I think Nexium is best at relieving heartburn because Nexium is also known as proton pumps inhibitor, which produce H^+ and k^+ ions to stop the production of stomach acid and allowing the ulcer to recover. The result shown that both Nexium and Omeprazole are best at relieving heartburn, they both titrates the HCl solution (stomach acid) with 0.34 gram/ml. while TUMS solution titrates 0.84/ml. my hypothesis was right and the result is kind of what is expected because Nexium and Omeprazole has same molecular formula, that mean they are pretty much similar to each other.

316-17 Slippery Situation

YaQun Zhou

(Ross – Products)

This experiment was design to test if homemade soap made from lye and fat can clean better than Dove brand soaps. I hypothesized that store bought soap will clean better because more chemicals were added to it. There are many things that we should be very careful about. The process of mixing lye with water is dangerous because it forms toxic fumes. And lye should not come in contact with metal because it will produce Hydrogen gas and will ignite. And it should be done with cold water because the reaction between the lye and water very extremely exothermic. Regular lab safety applies as well. First mix the Lye with cold water then let it cool, when it is cooled add the lye solution into the oil then mix to a thick mixture. Pour into soap bar to rest and harden. Use white cloth and stain to determine how well it cleaned. Use the two soaps to wash cloth that is soaked with stain. Then compare the results to see which cleaned better. The result proved my hypothesis to be wrong because the homemade soap cleaned 4 out of 5 stains, which is better than the Dove brand soap.