

2010

**Pittsburgh Regional
Science & Engineering Fair**

**Student Projects
Abstracts**

Intermediate Division

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Behavioral and Social Science.....	1
Biology.....	7
Chemistry.....	16
Computer Science / Math.....	25
Consumer Science.....	26
Earth / Space / Environment.....	33
Engineering / Robotics.....	38
Medicine / Health / Microbiology.....	41
Physics.....	46
TEAM.....	58

Intermediate Behavioral and Social Science

Project Number: MBS001 **Grade:** 7

Title: Can you teach an old dog new tricks?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS002 **Grade:** 8

Title: A Memory Increaser

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS003 **Grade:** 7

Title: Enhancing Plant Germination

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS004 **Grade:** 8

Title: What's In A Name?

Abstract: My project is determining if the meanings of people's names affect their personalities. I tested 41 seventh graders about their personalities. Each student described themselves and wrote down two classmates who could describe them best. After they were all described, I analyzed my results and found that 58.5% of their names affected their personality. This result was very close to my hypothesis. In my hypothesis I said that about 60% of the student's names would affect their personalities. The conclusion that I reached was my hypothesis was correct.

Project Number: MBS005 **Grade:** 8

Title: Who Let The Dogs Out?

Abstract: I wanted to know if petting a cat or dog will lower a person's blood pressure. I will get volunteer subjects. Take their blood pressure. Have the person pet a cat or dog. Take their blood pressure again. Compare the results.

Project Number: MBS006 **Grade:** 8

Title: Can the Nose Taste?

Abstract: Taste is often assumed to be done with the mouth. When people are congested, taste is altered. My experiment was to find out if the nose could recognize foods that are based on taste categories. These categories are sweet sour bitter and salty. I surveyed ten participants. The participants were asked to wear a blind fold, smell all foods, and then taste them. I would then record them as recognized or not recognized. My conclusion was that the nose can affect the ability to taste.

Project Number: MBS007 **Grade:** 8

Title: The Effects of Water and Sports Drinks

Abstract: This project explored the impact of consuming various sports drinks and water on the blood pressure and pulse of young women doing a modest exercise regimen. Baseline blood pressure and pulse measurements were obtained. Then, the 10 women enrolled in the study each briskly walked up and down 84 stairs. Blood pressure and pulse measurements were again obtained. The participants also consumed water or a sports drink and repeated the exercise. Blood pressure and pulse were again recorded. This study showed that certain sports drinks caused less elevation of blood pressure and pulse with exercise than did water.

Project Number: MBS008 **Grade:** 8

Title: Groovy Movies

Abstract: Will certain movie genre increase or decrease a person's pulse rate. I will need volunteers for this experiment. For each volunteer I will take their pulse. The subject will watch one movie clip. Subjects pulse will be taken after the clip. Repeat the steps for each movie genre. Analyze the results.

Project Number: MBS009 **Grade:** 8

Title: Short Term Memory Loss Versus Long Term Memory Loss

Abstract: Memory retention abilities among students in grades 3-8 were evaluated using a mystery visitor in each classroom. Students were surveyed regarding both short and long term memories of the mystery visitor. Results indicate that older students have stronger short and long term memories.

Project Number: MBS010

Grade: 7

Title: Food for Thought

Abstract: I have always wondered how you could improve people's memory. I wanted to learn if food could help your memory. To test this, I took four participants and had them study twenty Uno cards for ten seconds. I had them do this twice. I gave them different foods, testing them roughly two hours later. The results showed the fruits and vegetables improved memory the best, proving my hypothesis correct. Fruits and vegetables are good for your body and apparently also for your brain. If I would do this project again, I would use a longer testing span.

Project Number: MBS011

Grade: 8

Title: Does Chewing Gum Affect Your Skill Level?

Abstract: The purpose of the investigator's project was to find out if chewing gum affected a person's hand-eye coordination. The investigator tested eleven subjects total. The investigator had each subject play the game Bop-It five times (until failing to continue the game) at the beginning of the week. At the end of the week she tested each subject once again chewing gum. The investigator recorded the points that the subject got for each round of Bop-It. The investigator the concluded that chewing gum does affect a person's, but did not improve their skill level.

Project Number: MBS012

Grade: 7

Title: Do Women Remember More Details Than Men?

Abstract: To answer the question of short term memory retention between the genders, a fictional crime scene video was shown to a group of 10 men and 10 women. A questionnaire completed by the test subjects revealed that women have stronger short term memories, but that the subject's age is also a factor in memory retention.

Project Number: MBS013

Grade: 8

Title: Music and Comprehension

Abstract: Does listening to music help or hinder a comprehension? Can music help a person to study? Research shows that classical or instrumental music helps individuals study. In the experiment the music was playing as participants were reading a passage. Another group was tested, reading the same passage with no music. These individuals from both groups were then tested on their comprehension of the passage. The Results were varied, and were dependant on the individuals. The results were inconclusive, because they were based on individuals and showed no specific trend.

Project Number: MBS014

Grade: 8

Title: Pseudoscience 2: At a Distance

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS015

Grade: 7

Title: Using the Honor System

Abstract: The purpose of the project was to see how honest people are. I put two containers in the 6th grade hallway on a desk one saying how much each lollipop cost. I put 50 lollipops in one container then I left. I returned after school and count how many lollipops were taken. I continued this for 7 days. Then I put up a picture of eyes and face and continued that for 7 days. An average of 25 lollipops were stolen each without the sign up and an average of 5 lollipops were stolen each day with the sign up.

Project Number: MBS016

Grade: 8

Title: Can Adults over 30 pass an 8th grade Science Test?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS017

Grade: 8

Title: We All Got 'em

Abstract: This project shows the effect of heredity on fingerprint patterns. To test the experiment, the fingerprints of 4 families and 4 random individuals were taken. The prints were then examined to find similarities within family members and in the random individuals. After prints were examined and classified by patterns, some similarities such as similar patterns showed throughout families. But most every print was very different and unique to each person. Due to the lack of similarities within the families I came to the conclusion that heredity has no effect on fingerprints and everyone has their own prints.

Project Number: MBS018

Grade: 8

Title: Think Fast!

Abstract: Do you play video games? If you do when people throw things at you do you catch it? For this experiment I am going to be testing video gamers and non-videogamers reaction times. I am going to be testing different age groups. I am doing this experiment because I think it would be very interesting to know if video games really pay off. I am going to throw different objects at them and see how long it takes for them to react.

Project Number: MBS019

Grade: 7

Title: Color, Contrast and Acuity

Abstract:

How will the contrast or similarities of a target and its background affect acuity? It was hypothesized that greater visual acuity will occur when subjects view targets and backgrounds composed of complementary colors instead of analogous color combinations. High visual acuity will also occur with black combined with lighter colors and white combined with darker colors. 20 subjects were tested using 56 cards with 2 lines, 1.6mm apart. The distance at which the subject could identify two lines, and the color of the lines, was recorded. The results showed that dark colors with white are easier to see than black and white, complementary colors are easier to see than analogous colors, but black with light colors showed less acuity, partially supporting the hypothesis.

Project Number: MBS020

Grade: 7

Title: How does brand name affect perception?

Abstract: The purpose of this project is to find out whether or not brand name affects product perception in adolescents. Students will be asked to drink three cups of water, each a different brand. They will then rate each cup 1-5 based on how much they like it.

Project Number: MBS021

Grade: 8

Title: Low-Fat vs. Regular

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS022

Grade: 8

Title: Does Talking on a Cell Phone Really Effect Your Driving?

Abstract: The Purpose of my experiment was to find out if talking on a cell phone effects your driving. I had a male and female in their twenties, thirties, forties, fifties, and sixties play the game Mario Cart on the Wii. They played once normally and then once while talking on a cell phone. All of my test subjects except for the female in her twenties did better playing the game without talking on a cell phone. So I found that yes talking on a cell phone does effect your driving.

Project Number: MBS023

Grade: 8

Title: Teen Stress

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS024

Grade: 8

Title: Paranormal Evidence Study

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS025

Grade: 8

Title: Which Eye Color is the Best

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS026

Grade: 8

Title: Running Ability

Abstract: Music is a powerful tool and affects a person greatly. Music affects a person's mind, physical endurance, and learning ability. Many scientists have been experementing to find the effects of music on running ability. The experements consisted of two eighth grade students, one male and one female, which were very similar in size. During the trials four different genres of music, country, rock, classical, and modern were used. Given that the students were often competetive and tired my results are inconclusive.

Project Number: MBS027

Grade: 8

Title: Effects of Sleep Deprivation

Abstract: For my project I had six people that had 8 hours of sleep do a series of testing to check their reaction time. Then I had the same six people stay up for twenty-four hours and do the same test they did when they had 8 hours of sleep. I took all of my results and compared the 8 hours of sleep to the twenty-four hours of sleep. The end result showed you cant not react as fast with no sleep

Project Number: MBS028

Grade: 8

Title: The Stroop Effect

Abstract: In psychology, the Stroop effect is a demonstration of the reaction time of a task. The task in this experiment required volunteers to say the color of the word on a printed sheet. The experiment timed 50 people while they read a Stroop test. I recorded the amount of time volunteers needed to say the words and the amount of words they mispronounced or said incorrectly. A control group volunteers read regularly printed words. The result showed that it takes about triple the time to read words with the Stroop effect. The average of words mispronounced was 9 words.

Project Number: MBS029

Grade: 8

Title: How does heart rate change when doing a simulated activity on the Wii vs. doing the actual activity?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS030

Grade: 8

Title: Distractions and Reactions

Abstract: The purpose of this experiment is to determine whether distractions affect a person's reaction time, and to test different distractions to see how distracting they are. This is applied in texting while driving, and this test is to determine if doing other things while driving are equally or more distracting. My results proved that texting and reading were considerably more distracting than drinking water, and that both were almost equally distracting, depending on the person.

Project Number: MBS031

Grade: 8

Title: Heart Rate Recovery Time.

Abstract: Heart rate recovery time is the time it takes for your heart rate to go back to normal after it has been raised above normal. My project tested the difference in heart rate recovery time between athletes and non-athletes. I conducted my experiment by testing twenty athletes and twenty non-athletes; I recorded their normal heart rate and then asked the volunteers to run in place for two minutes. After completing the run, I recorded the amount of time it took for the students heart rate took to return for normal. The experiment concluded that athletes have a faster recovery time.

Project Number: MBS032

Grade: 8

Title: Rainbow Math

Abstract: The purpose of Rainbow Math was to determine the effect of different color paper on a twenty-five question math test. The students were tested on white, purple, orange, and yellow paper. The hypothesis in Rainbow Math was that the students would do the best on purple paper. The results of the experiment did not have a significant difference. The results of the project were that they did the worst on white, than purple, than orange, and then the best on yellow. The hypothesis was proven incorrect. There was only a 0.9 between the hypothesis purple, and the result yellow.

Project Number: MBS033

Grade: 8

Title: Reaction Time and Music

Abstract: The purpose of my project was to determine if music affected reaction time. My hypothesis was that music would affect reaction time. First, have subject listen to iPod. Next, drop meter stick while subject is listening to music. Last, record how far meter stick fell. The group that tested with music had a better reaction time. The hypothesis, if people are listening to music then their reaction times will be delayed, was not supported by the data

Project Number: MBS034

Grade: 7

Title: Does Writing Style Affect the Learning Ability of Students?

Abstract: This experiment was designed to see which font style helps students to remember information the best. The three fonts examined were cursive, print, and textbook. It was hypothesized that textbook would be remembered the most and cursive would be remembered the least. Three variations of a test were given to students. Eighty nine tests were given and were controlled for numerous sources of bias. The data indicated that print style was remembered the most and textbook font was remembered the least.

Project Number: MBS035 **Grade:** 8

Title: Does Gender Affect Different Types Of Memory?

Abstract: The purpose of my project was to compare different memory types between boys and girls. The memory types tested were verbal, nonverbal, functional, and incidental. Three boys and three girls were tested (ages 13-14) by a computerized memory test. Memory percentages were compared. The results showed that the girls had a better verbal, nonverbal, and incidental memory than the boys; however, functional memory was tied. The results indicated that my hypothesis should be accepted. The girls had a better average memory than the boys. To continue this research, I would examine a larger sample of students and add reaction times.

Project Number: MBS036 **Grade:** 7

Title: Blood Pressure Increase With Time

Abstract: This investigation was done to determine if blood pressure increases more the longer a person runs. I had 20 subjects run back and forth at their fastest speed for 30 seconds and 60 seconds and measured their blood pressure before and after running. A significant number of subjects' blood pressures were higher after the 60 second run than the 30 second run.

Project Number: MBS037 **Grade:** 7

Title: Simulation of Distractions During Operation of a Motor Vehicle

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS038 **Grade:** 8

Title: Gum Chewing Affects on Completing a Task

Abstract: The purpose of this experiment is to determine if chewing gum affects a student's ability to complete a task. The students were asked to complete a word search and order ping-pong balls. They did both of these tasks with and without chewing gum. After experimentation, the data showed that students who did not chew gum completed the word search on average 3.66 seconds faster than those who chewed gum. Students who chewed gum completed the ordering task 6.93 seconds faster than those who chewed gum. In conclusion, students who did not chew gum completed tasks faster than those who did.

Project Number: MBS039 **Grade:** 7

Title: Impact of Color on Kid's Memory

Abstract: The purpose of my experiment was to see which color combinations of letters and paper have the most impact on the short term memory of second graders. I divided the children in small groups and, in total, I showed each child eight words in each of the four color combinations. The color combinations included white, orange and green paper with black writing and black paper with white writing. The data showed that the overall best color combination was black writing on white paper. I conclude that second graders have the best rate of memorizing words best on white paper with black writing.

Project Number: MBS040 **Grade:** 8

Title: Got Gum?

Abstract: My experiment's purpose was to see if chewing gum helped students score higher test scores. I asked four eighth grade volunteers at honor level to help take two different math tests. The test with no gum was taken first, then the test with gum. I had two volunteers chew the gum for five minutes prior to starting the test. I had the other two volunteers chew their gum as they started the tests. From my results, chewing gum helped the volunteers concentrate. It appeared that the mint and cinnamon gum helped the best rather than two other fruit flavored gum.

Project Number: MBS041 **Grade:** 7

Title: The Stroop Test

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBS042 **Grade:** 8

Title: Tunes to Think To

Abstract: Some say food is good for thought, but now they're saying it's music that will soothe the soul and keep you focused. Will classical music improve the test scores of 30 eighth grade students? If classical music is played during a test, then the student scores will improve. Multiple tests will show some controversial results. In one group of students, I was correct in my hypothesis. In another group, it was quite the opposite.

Project Number: MBS043

Grade: 8

Title: Reaction Action

Abstract: Reaction time is the time between the presentation of something or sound to the time it takes for the person to react. My project wanted to determine if people's reaction was quicker to sight or sound. I tested 136 students. The first was a sight test I had the student that I was testing start walking, when I held up the stop sign they stopped as fast as possible, the student also completed a hearing test. For the hearing I said the word stop, the student stopped as fast as possible. After completing my data collection I found students' reaction to sight was quicker.

Project Number: MBS044

Grade: 8

Title: Validating the Rorschach Blot Test

Abstract: For years, Herman Rorschach's ink blots have been used to determine what troubles individuals. This work intended to learn if what patients see is truly reflective of their inner thoughts, or just based on the shape of the ink blot. A total of fifty people were given an in-depth interrogation featuring ten Rorschach blots. They were asked what they saw and if they ever had an interesting or memorable experience with that object. Out of the 301 cards, only 37% had a connection to the subjects' memories. Rorschach blots are an inefficient means of psychological evaluation.

Project Number: MBS045

Grade: 8

Title: Who Has The Best Sense Of Smell?

Abstract: I did this experiment to see whether children (7-10), teens (13-14) or older adult age (50-60) had the better sense of smell. I used eight people in each age group. I let each person try to identify eight different scents, bubblegum, peppermint, lemon, and strawberry, cherry, cinnamon and vanilla. My hypothesis was right that teens would have the best sense of smell, while the 50-60 year olds did the worst. I think teens did the best because their sense of smell is at its peak.

Project Number: MBS046

Grade: 7

Title: Is Texting While Driving Dangerous?

Abstract: Texting while driving is dangerous. It is killing thousands of people all over the world. This research is dedicated to try to show how deadly texting while driving is. Mario Kart Wii, a driving video game, was used to test (potential) drivers how their attention diverts from driving to texting. It demonstrated that their focus on the road is reduced significantly. The conclusion was, along with many other people, that texting while driving is dangerous. Future work is needed to generate more accurate results.

Project Number: MBS047

Grade: 7

Title: Indulgence Now or Reward Later?

Abstract: The purpose of this experiment was to determine the amount of delayed gratification skills present in children of kindergarten age. They were placed in two groups. To conduct this experiment, sixteen children of kindergarten age were required to sit in a room while being timed to see how long they could resist temptation. Group A was receiving a smaller reward. The experimental results were measured in how long they could wait before giving in. The results were that Group A had an average percent of skills. Group B had poor skills. The hypothesis is being accepted because Group A did perform better and their skills were superior.

Project Number: MBS048

Grade: 7

Title: Do animals react the same way people react when music is on?

Abstract: Music is something that is heard mostly everyday. I'm testing this experiment because I want to know if animals react the same way people react when music is on. I'm going to stay 3-4 hours and put on different kinds of music each day. Also I am going to write down what they do when music is on for each day.

Project Number: MBS049

Grade: 8

Title: Which sense can awaken a person the most efficiently?

Abstract: The purpose of this experiment was to find out which sense would awaken a person the most effectively. To conduct the experiment, individuals were woken up with various methods which each focused on one of the five senses. The experimental results were measured by timing how long it took for the test subject to awaken. Though the results of the experiment vary depending on the person, the outcome is quite clear, and my experiment has proved my hypothesis to be correct. The sense of touch can awaken a person the most efficiently.

Project Number: MBS050

Grade: 8

Title: Can You Feel Colors?

Abstract: The purpose of my project is to test to see if fourth graders can actually "feel colors". I first painted the insides of five shoeboxes five different colors and after they were dry, I cut slots for the hand holes. I went to my local elementary school to test my sister's class to see if they could feel colors. To my surprise, most of them actually could feel most of the colors, though they most often mixed up the colors black and white. I had one child, a boy, pick all correct answers.

Project Number: MBS051

Grade: 7

Title: Does playing a musical instrument influence your fingers' agility?

Abstract: The purpose of my project was to find if playing a musical instrument influenced finger agility. To experiment, I tested ten subjects. I had the subjects pick up and place down cards for one minute. I also had the subjects pick up pegs from a holder, set them down in a box, and place them back in continuously for one minute. I measured my results through the average and median cards and pegs for the musical and nonmusical groups, and through stem-and-leaf plots. The results showed that musical subjects were more agile, and that my hypothesis should be accepted.

Project Number: MBS052

Grade: 8

Title: Does Sight Affect Taste?

Abstract: My project tested to see if sight affected what people tasted. I made three different colored candies, but all were the same flavor. Then, I made the subject taste each candy for five seconds. Next, I made them answer a question, if they tasted different flavors or preferred one over another then sight affected their taste. With 81% of my subjects sight affected their taste.

Project Number: MBS053

Grade: 7

Title: Boys vs Girls: Hand Eye Coordination

Abstract: In my experiment, I tested 6 12-13 year old boys and girls to see their hand-eye coordination. I always wanted to know who had better coordination. I believed that I used a volleyball which they hit back and forth to each other, a tennis ball which they had to hit up and down with a racket, and two basketballs in which they dribbled at the same time. Each person did each test individually, except for the volleyball passing. After my testing, I added up the scores for boys and girls, and averaged them. I concluded that girls had better hand-eye coordination.

Intermediate Biology

Project Number: MBI001

Grade: 7

Title: Behold It's the Mold

Abstract: Everyone likes bread. In the cold, snowy, and wintery weather I don't like to go out and shop for bread. So, I wanted to know which type bread could last longer. I placed a slice of white, wheat, and sourdough bread in three separate Ziploc bags. I then sealed the bags and observed the bread for two weeks. Based on my data the wheat bread lasted the longest.

Project Number: MBI002

Grade: 7

Title: How much juice & water do some citrus fruits contain?

Abstract: The purpose of my experiment was to find out how much juice and water comes from citrus fruits. I did this so I could have a healthy substitute instead of drinking plain water. I sanitized my work area. I got out all the things I needed to perform it. I put all the fruits between the fruit presser and squeezed until nothing came out. I compiled all my data and observations. I cleaned my work area, and compared my hypothesis with my conclusion. My data was I squeezed the fruits, the lime contained the most juice, the lemon contained the most water.

Project Number: MBI003

Grade: 8

Title: Tap vs. Filtered Water on Aquatic Tank Life

Abstract: The purpose of this experiment was to find out if filtered water in your fish tank is safer than tap water to fish. The hypothesis of this experiment is that tap water will have a fatal effect on the fish whereas the filtered water won't. This experiment was done by testing both types of water in a few tests before and after experimentation. The fish were also studied every day and their interactions were recorded. After experimentation, the conclusion was that the chlorine in tap water is harmful and fatal to fish in a freshwater tank.

Project Number: MBI004

Grade: 8

Title: Are Learning Styles Inherited?

Abstract: The purpose of my project is to learn if learning styles are hereditary. The procedure that I used was simple, I provided multiple families with learning style surveys and asked them to complete them. The data showed if they had mainly similar or mainly different learning styles. After analyzing the data, I concluded that learning styles are not hereditary.

Project Number: MBI005

Grade: 7

Title: What do we know about the food that we eat?

Abstract: Today we have very little knowledge about the food that we eat. To address this fundamental question in a scientific way I collected several processed foods including several cereals; fresh vegetables, greens and fruits. The genetic material from these foods were analyzed for the presence of the DNA content that did not belong to them. All such foods were then classified.

Project Number: MBI006

Grade: 7

Title: Will the Algae Glow if the Light Doesn't Show?

Abstract: The purpose of this experiment was to investigate how the bioluminescence of the marine dinoflagellate *Pyrocystis Noctiluca* is affected by changes to its light/dark cycle. Three test groups, including 24 hours dark, 12 hours light/dark and 24 hours light, were tested. Results indicate that fluctuations do have an impact on bioluminescence levels.

Project Number: MBI007

Grade: 8

Title: What is the Most Effective "Green" Way to Control Weeds?

Abstract: A variety of environmentally-friendly weed control methods were evaluated, using rye grass as the "weed." Methods tested included the use of corn gluten, landscape fabric, shredded newspaper and mulch. Results indicate that the landscape fabric provided the best defense against weeds.

Project Number: MBI008

Grade: 7

Title: Temps. Going Up or Going Down

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBI009

Grade: 8

Title: Does the breed of cow affect the number of calories in the cow's milk?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBI010

Grade: 7

Title: Growing Green

Abstract: My science fair title is Growing Green. My question is which natural fertilizer will make green beans grow better. After doing my research, I hypothesized that the soil with coffee grounds will make the beans grow better. I planted two green bean seeds in three separate pots. Each pot was filled with soil and one of my recycled fertilizers. The choices were coffee grounds, crushed egg shell and dried crushed leaves. The pots were checked and watered daily and growth was charted. After 10 days, the pots that contained the coffee grounds showed the most growth out of all the others.

Project Number: MBI011

Grade: 8

Title: Forensic Fingerprint Analysis

Abstract: Did you ever wonder if there are similarities in fingerprints of family members? Fingerprints are all unique and none are the same. That doesn't mean there aren't any similarities. Some of the common types of fingerprints are loops, whorls, and arches. Loops are the most common, whorls are the second most, and arches are the rarest. Three families were tested for similarities. The results were compared to each other to see how the prints resembled the other family members' fingerprints. The results proved that there are similarities in relative's fingerprints. This conclusion supported my hypothesis.

Project Number: MBI012

Grade: 7

Title: Eye Dilation

Abstract: My project is called 'Eye Dilation Affects Peripheral Vision' and the goal of my project is to see if the eye dilation has any affect on peripheral vision. I tested 6 volunteers by using an apparatus to measure their peripheral vision in rooms with different lighting. I found out that with dilated eyes, peripheral vision was better. The eyes would be dilated when the room was dark.

Project Number: MBI013

Grade: 8

Title: Tall vs.Short - Who's Advantage?

Abstract: The purpose of the investigators project was to see if longer running distances favor taller runners, and to see if traditional speed tests used by high school and college scouts should be used for younger, usually shorter players. The investigator used a stopwatch to record 54.8m sprint times and 27.4m sprint times for each subject. The investigator looked for the largest natural break in height that would give him relatively even groups. He then calculated the groups' averages and ranges. The investigator concluded that longer running distances do appear to favor taller runners

Project Number: MBI014

Grade: 7

Title: Best Soil for Plant Germination

Abstract: My purpose was to find the best soil for plant germination. I wanted to find the soil that helped my plants grow faster. I took three different types of potting soil and they were, Miracle-Gro, Scotts, and regular potting soil. I planted grass seed in each type and watered them daily with 120mL of water. I found that Miracle-Gro helped the grass seeds germinate faster and more fuller.

Project Number: MBI015

Grade: 8

Title: Plant Aegis

Abstract: The point of my project is to see if plants are affected to an extreme extent by air freshening products. When you spray it in the air, there is good chance it can get to your plants. If the effect is very negative, there is a chance that the product is not good for humans. The other plants color, height, and texture are different than the control plant. Most of the other chemicals were able to compare well with the control fern.

Project Number: MBI016

Grade: 8

Title: Playing Hockey ~ Crossed

Abstract: This project tests hand/eye dominance in hockey. The purpose of this project is to see if scoring ability is affected by crossed hand/eye dominance. A brief explanation of my procedure is gathering my materials, recording the hand/eye dominance of all of my volunteers, then having each person shoot five balls right handed and five left-handed. Players that used their crossed dominances were able to view the net better and score more easily. conclusion, hand/eye dominance does affect the sport of hockey. My hypothesis is that shooters with crossed hand/eye might have a shooting advantage in any sport and it was correct.

Project Number: MBI017

Grade: 7

Title: Hydroponics with Carrot Tops

Abstract: My purpose was to learn which hydroponic solution carrot tops would grow in best. Based on my research, I hypothesized that carrot tops would grow best in water because all plants grow with water. I cut the tops off carrots and put each in one of three solutions: water, saltwater, and vinegar. I gathered growth data for a week. The carrot tops only grew in water, as much as 5.15 cm. They did not grow in salt water or vinegar, they dried out and got moldy. My hypothesis was supported because the carrots in water grew the most.

Project Number: MBI018

Grade: 7

Title: Hotter! Faster! Better?

Abstract: In this project I am testing to see if microwaves are harmful to plants. To test this I micro waved water for 3 minutes and for 2 minutes and distributed it to 6 plants. I distributed normal water to the remaining three plants. I watered the plants with 236ml of water every 3 days for 2 months. I hypothesized that the micro waved water will have some effect on the plants. It turned out that the water had no effect on the plants. All the plants grew at a normal rate. If I were to do this project again I would use water micro waved for a longer period of time and I would use different plants.

Project Number: MBI019

Grade: 7

Title: Are Fingerprints Hereditary?

Abstract: I chose this project to find out if fingerprints are hereditary. I wondered if a child's fingerprints could be inherited from their parents. To do this project, I took each of the participants' fingers and rolled them in ink. Then I analyzed the fingerprints. All of the participants' fingerprints were the "loop" type except one. This participant's fingerprints were unreadable because he works with sanding supplies which can wear away fingerprints. The conclusion of the project is that fingerprints are passed on from one generation to another.

Project Number: MBI020

Grade: 8

Title: Where Does Grass Grow the Best?

Abstract: The purpose of the investigator's experiment was to see where grass would grow the best. The investigator placed three cups containing 192g of topsoil and 7g of Kentucky bluegrass seed in an area that would have no contact with solar energy. She placed three other cups in an area that would receive direct sunlight and three more cups in an area where there would be little sunlight. She recorded data and watered the grass every other day for about two weeks. The investigator concluded that the Kentucky bluegrass located in indirect sunlight grew the best.

Project Number: MBI021

Grade: 8

Title: What Can Fertilizer Do for You?

Abstract: The purpose of the experiment was to determine which fertilizer produces the overall healthiest sunflowers. 907g of unfertilized soil was placed in each of the five pots. 15g of Miracle-Gro® Shake n' Feed was added to one pot (inorganic), 15g Garden Club Select Flower and Vegetable food to one pot (inorganic), 15g of cow manure (organic) to one pot, and 15g of horse manure (organic) to one pot. The pot without fertilizer was the control. Five sunflower seeds were planted in each pot and given 100ml of water every day. The Miracle-Gro® pot had the second tallest overall height with 18.04cm. It had the most leaves, and 3 of the healthiest looking plants. Miracle-Gro® had the overall healthiest looking plants.

Project Number: MBI022

Grade: 7

Title: Teeth vs. Drink

Abstract: The purpose of this experiment was to determine which beverages were worse for people's teeth by determining whether the pH level directly correlated with the amount of enamel loss. Six healthy teeth were weighed and soaked in different beverages for 12 days and reweighed. All teeth gained weight. In an attempt to dry the teeth, they were baked for 6 hours at 180oF and the weight of each tooth decreased (still > original weight). The hypothesis was partially proven correct because amount of weight gain did correlate with the pH levels and sugar content of beverage.

Project Number: MBI023

Grade: 7

Title: Your Music, Your Pressure

Abstract: I did this to find out about human blood pressure and pulse of different ages. I hoped to learn the effect of music on human blood pressure and pulse. In my procedure, I used five children, 5 adults, and five kinds of music. I measured the blood pressure and pulse after they heard the music. The results show that music will make the blood pressure and pulse go down if the subject is relaxed. Almost all blood pressures went down. In my conclusion, my hypothesis was supported. My project helps by knowing which music to play to lower blood pressure and pulse.

Project Number: MBI024

Grade: 8

Title: Unlucky Number 3

Abstract: I am testing the effects of third hand smoke on plants. I will have four types of plants and three groups of each. Group A, will be exposed to second hand smoke; Group B, will be exposed to third hand smoke; Group C, will be my control. Group A will receive smoke from the smoke machine that I created. Group B will receive a piece of cloth that was exposed to the smoke machine. Group C will not have any smoke exposure. I will do multiple trials for each group. Make observations and compare my results.

Project Number: MBI025

Grade: 8

Title: Caffeine Freak

Abstract: I tested the affects of caffeine on fish. I purchased twenty goldfish and kept them in environments where the temperature and amount of water was monitored. Daily, ten of the fish were given caffeine tablets and fish food pellets, while the other ten were only given fish food pellets. The fish's behavior, the speed of their swimming, their color, and the number of gill flaps per minute were recorded and compared to each other. Caffeine does affect the fish's speed of swimming and their behavior, but did not change their number of gill flaps per minute, or color.

Project Number: MBI026

Grade: 8

Title: Light, and Cricket Feeding Habits

Abstract: The experiment was conducted to find a humane way to get rid of pests and for better feeding options for owners of reptiles. Cellophane was used to tint the light of two 40 watt aquarium bulbs. Black paint was used to block light for one of the containers. The black and green containers had the most food consumption while blue and yellow had the least. White light had medium food consumption. Blue and yellow light could be used to drive out pest insects without killing them. Green and no light can be used to get feeder crickets to eat more inducing higher protein to the pet.

Project Number: MBI027

Grade: 8

Title: Which Plant Grows Better?

Abstract: I wanted to know which White Butterfly Plant, Syngonium Podophyllum, grows better, upside down, or right side up. I also wanted to know if other plants can grow better upside down. I bought 2 Syngonium Podophyllum plants, 2 plastic pots and a bag of potting soil. I made each pot like hanging baskets. On the upside down plant I drilled a 1 ½" hole in the bottom of the pot for the plant to go through. Every week on the same day I checked the plants height and watered them with the same amount of water. In the end I concluded that PLANT #1 did grow better than the PLANT #2 but not by much, but PLANT #2 had less yellowing leaves and remained overall healthier.

Project Number: MBI028

Grade: 8

Title: Shoo Flies

Abstract: How does the incubation temperature affect the sex ratio of Drosophila melanogaster (fruit flies)? I hope to prove that hotter temperatures will produce more male fruit flies, and cooler temperatures will produce more females. In this experiment, I bred the fruit flies and waited for them to hatch. Then, I counted the ratio of males to females. The results I did get showed that the higher incubation temperature produced more females. Therefore, my hypothesis was wrong.

Project Number: MBI029

Grade: 8

Title: The Loyalhanna Creek Tells a Story

Abstract: For my science experiment, I just tested to see what levels of pH and phosphate were in the Loyalhanna. I used a test kit and took the tests once a month. The results were that the phosphate was the highest in the month of February (winter) and the pH was the greatest in the months of March, April, and May (spring).

Project Number: MBI030

Grade: 7

Title: How does the androgen receptor play a role in Prostate Cancer?

Abstract: In the prostate cancer cells A-R protein is localized in the nucleus, while in the normal prostate cells the androgen receptor is present in cytoplasm. In the presence of Androgen hormones like DHT, this protein moves from cytoplasm to nucleus. In nucleus it activates the gene responsible for the cell growth. In the present study my aim is to study the mechanism of the Androgen receptor gene. When the cells were treated with DHT, the green fluorescent protein (GFP) tagged with A-R was transported to nucleus. By understanding the mechanism of Androgens Receptor, we can find the cure for prostate cancer.

Project Number: MBI031

Grade: 8

Title: Hours of Light and Plant Growth

Abstract: The title of this investigation is Hours of Light and Plant Growth. The purpose is to see if the number of hours of light a plant receives affects its growth. The hypothesis is that the 12hour category will grow the tallest. First I gathered all the materials. Then I planted the plants and set them under the light. I measured and watered them every other day. I recorded the measurements in a note book. The 12 hour category grew the tallest because of consistency. the 15 in second, 9 in third, and the 24 hour was last.

Project Number: MBI032

Grade: 8

Title: Keeping fruit fresh

Abstract: I love fruit but sometimes don't eat that much too fast. I would like to store it longer, so that's why I chose to do this experiment. I am going to take three bananas and put one in a green bag, one in a ziploc bag, and leave one out in the air. I will record which method keeps bananas the freshest longest.

Project Number: MBI033

Grade: 7

Title: Effectiveness of SPF

Abstract: The purpose of this experiment is to see which sunblock sun protection factor (SPF) blocks the most rays from the sun. I used clear plastic for skin and a monitor to obtain the UV (ultra violet) readings. I applied SPF 15 to 7 sheets , SPF 30 to 7 sheets , SPF 50 to 7 sheets , and SPF 70 to 7 sheets. After the test , I observed that each one blocked all the rays , but the higher SPF , the longer it last. I took base readings and the results where from 2 to 7for the Uv readings. The UV readings with sunblock were zero.

Project Number: MBI034

Grade: 7

Title: What Type of Fertilizer Helps Beans Grow Fastest

Abstract: The purpose is to test which type of plant fertilizer helps beans grow to a height of 5.08 cm. A total of 36 beans were planted. Jobes Plant Spikes, Miracle-gro Organic Choice and Miracle-gro All Purpose Plant Food were

each applied to 9 seeds. The last 9 seeds had no fertilizer applied. The data showed that an insufficient number of plants grew to make a firm conclusion. The plants that did grow were those given the Miracle-gro All Purpose Plant Food at an average of 12 cm tall, and the non-fertilized plants which averaged 8 cm tall.

Project Number: MBI035

Grade: 8

Title: How do parabolic mirrors affect plant growth?

Abstract: This experiment's objective was to discover whether or not plants' height increased when grown with parabolic mirrors. Procedures involved growing a total of 120 lima bean seeds, and measuring the height of 60 seeds grown with and 60 seeds grown without parabolic mirrors. Measurements were conducted over a 20 day period. Results were inconclusive and showed that there was not a significant difference between the height of the plants grown with and without parabolic mirrors. More research on the subject would be beneficial and could include the testing of standard mirrors as well as parabolic.

Project Number: MBI036

Grade: 7

Title: Swimming in Acid

Abstract: Please visit student's exhibit for the abstract.

Project Number: MBI037

Grade: 7

Title: Does Music Affect Heart Rate?

Abstract: The purpose of my project was to see whether certain music affected your heart rate. My hypothesis was that there would be a difference in heart rate depending on the music. To test this I had nine random subjects in three age groups. I took their pulse before and during the experiment. I had them listen to three samples of music two minutes apart for one minute each while I took their pulse.

Project Number: MBI038

Grade: 8

Title: Heat on Radish Seeds

Abstract: The purpose of adding heat to radish seeds was to see if the heat increased or decreased the growth of the embryo. There were ten seeds that were but in the microwave for different amounts of time. The control had the most seeds sprouted put the first seed to sprout were the ten sec. group. Adding heat does make the seeds sprout quicker, but adding too much heat will not make them grow. The heat will increase the growth of the seed when microwave for 10 or 15 seconds.

Project Number: MBI039

Grade: 7

Title: Growing plants under colored light

Abstract: The purpose of this experiment was to find out which color of artificial lights makes sunflower seeds grow the tallest. In this investigation, I will let 144 sunflower seeds grow under different colors of 4 artificial light for a period of 4 weeks. I will use orange, red, green, and blue lights. I will measure the height of each plant every day after germination, and, at the end of the investigation, I will compare results using a graph.

Project Number: MBI040

Grade: 8

Title: In? Or? Ganic?

Abstract: I wanted to find out if organic or inorganic fertilizers were better for growing plants. I planted pea seeds in cups of soil. One soil contained organic fertilizer and the other soil with inorganic fertilizer. I watered the plants and made observations about the growth and health of the plants.

Project Number: MBI041

Grade: 7

Title: Heat It Up!

Abstract: Does the temperature of the water effect plant growth? For my experiment, I will use radish seeds. I will keep the air temperature, light, and amount of water the same for all plants. The only change will be the temperature of the water. I will use three different water temperatures. Every three days, I will measure the plant's growth and record the data, and compare the results.

Project Number: MBI042

Grade: 7

Title: Fresh as a Daisy

Abstract: My experiment is "Do commercial preservatives or homemade preservatives keep white carnations alive longer?"

The purpose of this experiment is to find out what solution for flowers kept them alive longest.

To conduct this experiment, I tested a control group (plain water), a commercial preservative, a sugar solution and a penny solution. I tested all of these solutions for two weeks.

The experiment results were measured by observations. I found that the sugar and penny solutions both lasted the longest.

My testing concludes that my hypothesis was proven wrong. Homemade preservatives kept carnations lasting longer than commercial preservatives.

Project Number: MBI043

Grade: 8

Title: Compost vs. Chemicals

Abstract: The purpose of my experiment was to see which type of soil plants grow the best in. The soil types I used were compost, Miracle Gro, and plain garden soil. To test this I grew three lima bean plants in each type of soil, giving each plant the same amount of water and sunlight. My results were that Miracle Gro grew the tallest plant, then garden soil, then compost. Miracle Gro also grew the longest leaf, then compost then garden soil. I concluded that although Miracle Gro will grow the tallest plants it contains some chemicals that can be toxic.

Project Number: MBI044

Grade: 7

Title: Catching Criminals... One Step at a Time

Abstract: My project was to determine if there is a relationship between a person's height and his or her stride. I used a sand pit and a tape measurer to measure stride length. I used about 20 volunteers, whose height I measured and who walked about 20 meters in the sand pit. I measured the distance between their footprints. The data showed that there was no strong correlation between height and stride. The strongest correlation was with the young male volunteers. I can conclude that measuring stride is not an effective method for deducing height.

Project Number: MBI045

Grade: 7

Title: Inside The Many Kinds of Soil

Abstract: The purpose for this experiment is to see if using different growing substances makes a difference in plant growth and condition. After deciding on the project I purchased the materials. I placed one cup of soil into nine pots, then added fertilizer to three, plant food to another three leaving the last three with only the soil. I watered them with ¼ cup of water every other day. Two weeks later I measured the plants and recorded the findings in my logbook. I'm concluding this project by confirming that in most cases fertilizer helps plants grow taller.

Project Number: MBI046

Grade: 7

Title: How Drought Conditions Affect Grass Types

Abstract: This experiment tested drought tolerant grasses. The experimenter put the pans on a table, put 5 cm of soil in each pan, sprinkled 3 grams of seed on top, covered the seeds with soil, gave the plants 236.5 mL of water each day until germination occurred, no water was given to the plants after germination, last the experimenter recorded which plant was the last to die. The experimenter had one plant that had 2 cm of brownness, while the other three didn't die. The experimenter concluded that Kentucky Blue, Red Fescue, and Penn State are the most resistant to drought.

Project Number: MBI047

Grade: 8

Title: The Effect of Cough Medicine on Daphnia

Abstract: My experiment is to see which brand of cough syrup increases the heart rate the most. I placed the Daphnia under the microscope without any medication, then counted the heartbeats for thirty seconds. Next, I added the medicine to the Daphnia and counted the heartbeats for thirty seconds. The first medication was Delsym, second was Robitussin, third was Target Brand, and last was Healthsense. I conducted twenty-five trials per cough syrup. My results showed that Delsym raised the heart rate the most. Next time I would be interested in testing different allergy medications or only children's syrups.

Project Number: MBI048

Grade: 7

Title: Memory with Sight and Sound

Abstract: The purpose of my experiment is to determine if people remember audio or visual information better. My hypothesis states that people will remember visual information better. My Hypothesis was supported by the data. The subjects were required to read a list of words and listen to a list of words and then write them down. The visual method had a higher average than the audio method.

Project Number: MBI049

Grade: 7

Title: Physiological Impacts from Sports Drinks

Abstract: To evaluate the impact of sports drinks on pulse, temperature and blood pressure, test subjects' vital signs were measured before and ten minutes after consuming various beverages. Results are presented for both female and male subjects.

Project Number: MBI050

Grade: 8

Title: How Much I is in Your Salt?

Abstract: I chose this project to find out how much iodine is in the salts that other people use. I hoped to prove that some salts contain more iodine than others. In my experiment I measured all my ingredients separately. I mixed starch and iodine with the water, then, added measured salt, vinegar, and peroxide to the starch solution mixture. Iodized salt had the most iodine, followed by sea salt, then the cheapest, plain, and then kosher. Major findings were that iodized had the most, while kosher had the least. My hypothesis was wrong and shocking.

Project Number: MBI051

Grade: 7

Title: Grass and Water

Abstract: Will the type of water used affect plant growth? The hypothesis is that the plant watered with filtered water will be healthier because filtered water is rid of all toxins. A brief part of the experiment is as follows. The first plant was watered with tap water. The second was watered with filtered water, and the third was watered with rain water. Each plant was watered with the specific water every other day throughout the course of eight weeks. The growth of each plant was closely monitored and the progress was documented. The results support the hypothesis.

Project Number: MBI052

Grade: 7

Title: Preservatives Effect on Mold

Abstract: I want to know if preservatives affect mold growth. So I set up an experiment to find out. I will put four pieces of bread (each different types, two with preservatives, two without) in separate plastic baggies. Then I will let them sit in the sunlight for exactly one week. After a week I will take them out and measure the total area of the two non-preservative and preservative pieces. I am predicting that the preservatives will slow the mold growth and that more mold will grow on the bread without preservatives.

Project Number: MBI053

Grade: 7

Title: Seed Germination

Abstract: Are the effects of hydrogen peroxide on seed germination harmful or helpful? It is hypothesized that the low concentration of hydrogen peroxide will benefit the seeds better than the none, medium, or high concentrations. A brief procedure of the experiment is as follows. I made my growing solutions, none, low, medium, and high concentrations. I placed folded paper towels into four plastic baggies. I then spooned in some of the solutions into each of the bags according to what was labeled on the outside. I arranged ten beans on the paper towels and left them to grow for ten days. The results do support the hypothesis.

Project Number: MBI054

Grade: 8

Title: How Quickly Can Mice Learn by Observation

Abstract: The purpose of this experiment was to test mice in order to determine if they are visual learners. Four mice were trained to complete four different tasks. Then eight untrained mice had an opportunity to observe the trained mice zero, one, two, or three times for all four tasks. The untrained mice then were placed in the test chamber to complete the tasks. Data was recorded in seconds. The time to complete the task data was random and could not support the hypothesis that mice are visual learners. The results could have been affected by health, gender, or attitude.

Project Number: MBI055

Grade: 7

Title: Understanding the Voice and Vocal Range

Abstract: My experiment shows that age and gender affect human vocal ranges. The vocal ranges of girls and boys are about the same, but as they age, their vocal cords undergo different, gender-related change. I hypothesized that these changes affect vocal ranges. I had 20 participants (5 girls, 5 boys, 5 women, and 5 men) sing a simple note progression, testing how low and how high they could sing without strain. My results showed a wide disparity between the vocal ranges of girls and women, and between boys and men, a finding that supported my hypothesis.

Project Number: MBI056

Grade: 7

Title: Growing Up Strong

Abstract: I wanted to find out how acid rain effects plant growth. Take 15 plants, divide them into 3 categories; acidic water, tap water, and tap water mixed with acidic water. Water each plant with the same amount of solution. Allow to grow for a certain period of time and record the observations and plant growth. Compare my results.

Project Number: MBI057

Grade: 7

Title: Watching Grass Grow

Abstract: I wanted to determine which type of grass seed grows the fastest, fullest, and tallest. I will compare Winter Rye, Sunny, Penn State Mix, and Shade grass seed. I will plant five pots of each grass seed type. Water each pot daily. Observe the plants for four weeks. Average and compare results.

Project Number: MBI058

Grade: 8

Title: Does Music Affect Heart Rate?

Abstract: My project is about if music can affect heart rate. Either if it is a rise or a decline in your heart rate. I will perform this project on a measured track, measuring ¼ mile per lap listening to a song from 7 different genres of music including: Rock, Pop, New age, Reggae, Classical, Rap, Heavy Metal. After every ¼ mile run I will record my heart rate and put it on a graph. I will also run one lap without music as a base for the heart rate of music to be based upon.

Project Number: MBI059

Grade: 7

Title: Does Dog Saliva Kill Bacteria?

Abstract: My project is about dog saliva killing bacteria. I put agar into ten petri dishes, and I grew bacteria on it. I let it grow for three days. After the bacteria grew, I collected dog saliva, and put it on filter paper. Then I put the filter paper in the center of the petri dishes. I labeled the petri dishes dog #1, dog #2, and dog #3, control, and bleach. I waited three more days, then estimated the percentage of bacteria killed. My hypothesis was supported by the data.

Project Number: MBI060

Grade: 8

Title: Best Method to Fertilize *Raphanus sativus*

Abstract: Fertilizer has high impacts on plant growth, but does not always show positive results. This experiment was performed to determine if a varied fertilizer application schedule has positive or negative results on Radishes. 375 seeds were distributed equally into 15 plastic containers filled with equal amounts of potting mix. There were 5 pots in each of three groups and each pot contained 25 seeds. One group was the control and remained unfertilized, while the other two groups the schedules on which they were fertilized varied. Growth of the plants were measured, recorded, and averaged. The hypothesis was proven because the best results were seen when the entire amount of fertilizer was applied at once as opposed to multiple smaller doses.

Project Number: MBI061

Grade: 8

Title: Bug Off

Abstract: The purpose of this experiment was to see how natural herbs can be used to deter pests. Herbs such as cinnamon and clover were used as a negative stimulus to deter ants. Overall, this biology experiment showed that natural herbs can replace harmful pesticides and chemicals.

Project Number: MBI062

Grade: 7

Title: Nutty, Nutty Squirrels

Abstract: The problem is, "Will the squirrels favor one food more than the others?" It is hypothesized that they will like the Backyard Wildlife food the best. A brief procedure of the experiment is as follows. I fill the squirrel feeder up to the black line made of tape with food. Every day, I measure how far the food has gone down. After 4 days, I empty the squirrel feeder and put a different type of food in. I repeat this procedure until all of the foods have been tested. I found that the results do support the hypothesis.

Project Number: MBI063

Grade: 8

Title: How does algae affect pH?

Abstract: The purpose was to determine whether algae affect the pH of a solution and, if so, whether this effect varies for different solutions and different amounts of algae. Using tap water, alga-gro nutrient solution, and Ohio River water, I added 0mL, 10mL, 20mL, or 30mL of algae to 36 samples. For ten days, I measured the pH and counted the number of algae cells visible at 400x magnification of each sample. My data analysis showed that the presence and amount of algae was correlated to change in pH, and that the degree of change was different for each solution.

Project Number: MBI064

Grade: 8

Title: How Does Music Affect Aquaculture?

Abstract: Does music affect aquaculture? Minnows are common fish used for fishing bait. Music can be found almost anywhere. Many people don't realize it but they often sing their favorite songs while working, does this harm/help aquaculture? The fish were set in separate rooms to ensure the music didn't carry from one room to the other. Different music types were played to test the different outcomes. Each group got the same amount of music in a day and had 15 minute breaks between each hour of music.

Project Number: MBI065

Grade: 7

Title: Comparison of Various Hand-Washing Methods

Abstract: The variables of time and water temperature were investigated in this experiment. Specifically, a controlled amount of "germs" were placed on the scientist's hands, then a given procedure was used to wash the hands. The cleaned hands were then swabbed and any resulting germs were plated onto agar, and bacterial allowed to grow. The bacterial colonies were quantified.

Project Number: MBI066

Grade: 7

Title: Are Fingerprints Hereditary?

Abstract: My hypothesis was that fingerprints were hereditary. The results of my experiment were that fingerprints are hereditary. From my data my hypothesis was supported because, I thought that family's fingerprints were all the same, and when I tested the family there were only three different types of fingerprints. In conclusion, fingerprints are hereditary. The results of my experiment may not be accurate because some sources of error may have occurred while experimenting such as smuggling in the fingerprints and human error, I read the fingerprints wrong. In conducting this experiment again I would test more people and used a higher quality ink.

Intermediate Chemistry

Project Number: MCH001

Grade: 7

Title: The Rocky Road To Alkalinity

Abstract: Pennsylvania has acid rain, yet fish and plants still live in most of its creeks. My experiment will test to see if rocks neutralize the acid so that plants and fish can live there. I will get acid and then I will add water so it has the same pH as acid rain. Next, I will select 4 rock samples that are commonly found in Pennsylvania. I will pour my simulated acid rain onto the rocks and record the pH after the acid has been neutralized. I will have 10 samples of each type of rock.

Project Number: MCH002

Grade: 8

Title: The Truth About Preservatives

Abstract: The purpose of my experiment is to determine how much longer a food that contains preservatives lasts than a food that does not contain any.

Project Number: MCH003

Grade: 8

Title: Iron in Fruit Juices

Abstract: The purpose of my experiment was to figure out which type of fruit juice contained the most iron, if it contained any iron at all. I tested pineapple, cranberry, white grape, and apple juice. I started my experiment by mixing each type of fruit juice individually with tea. Then I let the mixtures sit overnight. After completing the experiment, I found that pineapple juice contained the most iron and cranberry juice didn't contain any iron at all. Pineapple juice had the most iron, meaning it was the most iron-rich juice of the four types of juices I tested.

Project Number: MCH005

Grade: 7

Title: Amt of Chem Affect Taste of Bottled Water?

Abstract: This project was chosen to discover if the amount of chemicals in bottles water affects the taste. Four brands of bottled water were analyzed and blind taste-tested by one hundred participants. The blind taste-test had participants record the water they preferred. The water was analyzed using two method: The Pur-Test Water analysis and the Water Link Data Mate. The bottled water preferred by most of the participants was Evian with thirty-four percent. Evian was the only bottled water to have no trace contaminants in eight categories. The water with the least amount of chemicals was preferred by those surveyed.

Project Number: MCH006

Grade: 8

Title: The Fizz Factor

Abstract: My science project experiment is to find out if soda loses its carbonation more in cold or room temperatures. As I did my research, there were many ways to do this project, but I decided to use a procedure with balloons. I will put balloons over the rims of soda and observed to see which temperature of soda loses its carbonation within a three day period. Each day, I will record and also take pictures of each bottle of soda to see the progress. In the end, I think that the room temperature soda will lose its carbonation more than the cold soda temperatures.

Project Number: MCH007 **Grade:** 7

Title: Which Salt Will Lower the Temperature the Most?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH008 **Grade:** 7

Title: What brand of disinfecting wipes will most effectively kill bacteria?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH009 **Grade:** 7

Title: Onions

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH010 **Grade:** 8

Title: Which streams and lakes in Garrett County can support a healthy trout population?

Abstract: My project was to see which streams and lakes could support a healthy trout population in Garret County. I hypothesized that all of the streams could support a healthier trout population than the lakes. To conduct my experiment I used different tools to find the pH, turbidity, salinity, acidity, dissolved oxygen, and temperature of each test site. I found that none of the sites did better than the rest. All of the sites could support a trout population; it just wouldn't be the healthiest. To conclude, my hypothesis was wrong because the lakes were just as good as the streams.

Project Number: MCH011 **Grade:** 7

Title: Soggy Cereal

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH012 **Grade:** 8

Title: How Does Steel React To Different Solutions?

Abstract: The purpose of my experiment is to see how different solutions affect steel. I submerged four pieces of steel half way into four different solutions. These solutions included tap water, cranberry juice, salt water, and soda. I monitored the steel, took pictures, and changed the solutions out every week. At the end of the three weeks in which the project took place I found out that salt water had the most prominent effect on steel. I presented my data in a pictograph, which showed the weekly change in appearance for each piece of steel.

Project Number: MCH013 **Grade:** 8

Title: Taking Off Your Coating

Abstract: Which liquid helps with the dissolution of ibuprofen? I will take 125mL of water and put it into a beaker. Place the beaker on a hot plate/stirrer. Turn the heat on, allow solution to reach 36 degrees celcius. Turn the stirrer on 6. I will then add 4.92 mL of toilet bowl cleaner to recreate stomach acid. Adjust the stir control to 4 and add an ibuprofen tablet along with 30 mL of coke. Make observations. Repeat steps for each liquid of water, milk, and orange juice. Repeat the steps ten times. Average and compare results.

Project Number: MCH014 **Grade:** 7

Title: What is Acid Level in Candy

Abstract: The purpose of this experiment is to determine the acid content in various candies. The experimenter dropped candies in water and then after six minutes of soaking, the candies were tested for the acid content by using a pH scale. Sour Skittles had an average pH of 4.71, Grape nerds had an average pH of 5.85, and Original skittles had an average pH of 7.85. The hypothesis was proved correct because Sour Skittles were the most acidic. The skittles are the most acidic because the lower the pH reading, the higher the acid level.

Project Number: MCH015 **Grade:** 7

Title: The Color Effect

Abstract: The purpose of my project is to determine whether the colors of foods or drinks affects whether we consume them. The procedure started by placing different colors of Gatorade, M & M's and apples on the experiment table. Then seven subjects completed the experiment and answered questions which were then recorded in my data book. The results matched my hypothesis: The color of food or drink will dramatically affect the subjects' choices. In conclusion, color played a major role in determining whether or not someone chose to consume a certain food or drink.

Project Number: MCH016

Grade: 8

Title: Burn Baby Burn!

Abstract: After constructing a calorimeter, 7 grams of the product being tested were placed on a aluminum tin. The top can of the calorimeter was filled with 150mL of distilled water. The initial temperature of the water was recorded. Food was ignited, placed beneath the calorimeter and times. The change in water temperature was measured and recorded. The burned food ashes were massed. The energy released was calculated, recorded, and averaged.

Project Number: MCH017

Grade: 7

Title: Rot The Core

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH018

Grade: 8

Title: Effect of Antacids on pH of Gastric Juice

Abstract: Antacids are commonly used non-prescription drugs that help with heartburn and acid indigestion. This experiment was conducted to show which antacid works most effectively. Tums was believed to work the best due to its brand popularity. Three trials were conducted for each of the 12 antacids and the control, water. 50 mL of gastric juice was added into a beaker containing a magnetic stirrer, and heated to body temperature. The initial pH was recorded, and the antacid was added. The pH was measured every 15 seconds for 10 minutes and results were recorded using the average of the 3 trials per antacid. The data showed that Mylanta Ultimate Strength raised the pH the highest. The fastest acting antacid was a generic, Asti's Leader, which came close to Mylanta in the final pH. Therefore, it gives you more for your money.

Project Number: MCH019

Grade: 8

Title: It's Rusted!

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH020

Grade: 7

Title: Corrosion Motion

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH021

Grade: 7

Title: Vinegar + Baking Soda Reactions

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH022

Grade: 7

Title: Can You Super Cool Water?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH023

Grade: 7

Title: To rust or not to rust

Abstract: A shear was used to cut steel, stainless steel, and aluminum to a measurement of 77mm X 26mm x 2mm. 200ml of acid rain, vinegar, club soda, tap water, and vegetable oil, which served as the control was placed into 180 styrofoam cups. 10 grams of road salt was dissolved into 200 ml of tap water. The metal was soaked for a week before being removed, allowed to dry and mass. This procedure was repeated for 8 weeks.

Project Number: MCH024

Grade: 7

Title: The Naked Egg

Abstract: I wanted to see what liquid would break down a egg shell, here is the liquids, vinger, lemon juce, hydragen proxside. For eight days I let them sit in the fluids, on the eighth day I looked at them and they were naked

should i say but not all of them. The first egg had no shell, the second egg had a little egg shell, the third egg had alot of shell and if I would give it more time it would have no shell, egg one and to felt like rubber balls but the third felt like sand. I Found out that when you putt a egg in fluid it will take off some of the shell.

Project Number: MCH025 **Grade:** 8

Title: Hot Ice

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH026 **Grade:** 7

Title: Enamel Erosion

Abstract: Which carbonated drink decays teeth fastest? It is hypothesized that 7up will do more damage than Coca-cola Classic, but less damage than Mountain Dew. A brief procedure of the experiment is as follows. Three small yogurt cups were filled with different carbonated beverages. One tooth was placed into each of the cups after being measured. The teeth would sit there for a week. They were then removed from the cups and measured again. After that I put the next teeth in.

Project Number: MCH027 **Grade:** 7

Title: Temperature vs. Air Pressure

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH028 **Grade:** 7

Title: Do You Judge Your Candles

Abstract: The problem is, "What kind of candle will burn the fastest and furthest?" It is hypothesized that scented, colored candles will burn faster and farther than white unscented candles. A brief procedure of the experiment is as follows. First, get out all your candles, unscented and scented. Second, set your timer to five minutes, you will increase your time every time you experiment with these candles. Your next step is to light all the candles and start your timer. When five minutes is up, blow all of the candles out and measure their wicks. Last time is to record your data. Here are the average lengths of all the candles: white unscented candle 3 1/4 cm, Cranberry scented 9 1/4 cm, Ocean Breeze scented 2 1/3 cm, Fresh Rain scented 5 cm. The candle that had the most length was the Cranberry scented candle. The purpose of this experiment was to see if scented, colored candles would burn faster and farther than the white, unscented candles. The results showed that scented and colored candles do burn faster and farther than white unscented candles. The hypothesis was supported.

Project Number: MCH029 **Grade:** 8

Title: Alka-Seltzer Temperature

Abstract: The purpose of my experiment was to find out how Alka-Seltzer tablets dissolve in different temperatures of water. I will use cold, room temperature and hot water. I will add whole Alka-Seltzer tablets to the water and time how long it will take them to dissolve. I think the hot water will dissolve the Alka-Seltzer the fastest. I hope to learn how temperature affects the speed of chemical reactions.

Project Number: MCH030 **Grade:** 8

Title: What's Up with our Water?

Abstract: Water is an incredibly important aspect of our daily lives. A lack of water to meet daily needs is a reality today for one in three people around the world. However, many of us know very little about the water we use each day. My project compared six different water sources from the Pittsburgh area i.e. streams, rivers, well, pond and tap water to prove that water closest to human population had more contaminates. My experiments consisted of visual and chemical tests using a water testing kit. My hypothesis was correct - the ground water sources closer to human population had more pollutants than the ground water from rural areas.

Project Number: MCH031 **Grade:** 8

Title: Bombs Away

Abstract: The purpose of my project is to understand the chemistry and physics of an explosion and also observe the factors that affect it. I will look at fuels such as hairspray, perfume, spray deodorant, breath spray, and bug repellent. I will also look at the chemicals inside the sprays and see how they affect the explosion. A launcher was built with a grill igniter and a pressure guage. The fuel was sprayed into a film canister and it was launched at different angles. The combustion of the chemicals cause an explosion which allows the canister to launch. Based on certain measurements, kinetic and potential energy was calculated. To conclude the project the potential was greater in the 90 degree angle than a 45 degree angle. Kinetic and potential energy is highly dependant on launch angles.

Project Number: MCH032 **Grade:** 7
Title: Washing Away the Years
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH033 **Grade:** 7
Title: Gone In Minutes
Abstract: In my experiment "Gone In Minutes" I wanted to find out how long it would take for each acidic drink to dissolve a piece of meat. I wanted to do this project because I think if that acid was sitting in your stomach, it could do some damage to your organs, if the acid was strong enough. After doing my research, I hypothesized that the coca-cola would dissolve the piece of meat in the shortest amount of time because of the amount of citric acid contained in the coca-cola. While testing my experiment I went through a few steps. First, I had to fill each cup with lemon juice, coca-cola, and grape juice. Next, put a piece of meat in each cup. Finally, I waited for the meat to dissolve and then I recorded the results. In conclusion, my experiment proved my hypothesis correct because on average, the coca-co;a dissolved the meat in about 30 minutes, the lemon juice in about 39 minutes, and the grape juice in about 48 minutes.

Project Number: MCH034 **Grade:** 7
Title: More Burn for Your Buck
Abstract: The purpose of the experminent was to learn what shape of wood lost the most mass when burned. Three different shapes of wood were massed, burned for two minutes, and massed again. It was found that the star shape peices of wood lost more mass than squares and circles. Another question that could have been asked type of wood loses the most mass after being burned.

Project Number: MCH035 **Grade:** 7
Title: Ice and rate of melting
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH036 **Grade:** 8
Title: Longevity of fire under various environmental conditions
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH037 **Grade:** 7
Title: Corrosion Killer
Abstract: The purpose of my experiment was to see what liquid could take the moast corrosion off of its penny within 14 hrs. For my procedure I put 4 pennies in 4 glasses filled with 4 different liquids. Then I waited 14 hrs. When the time was up I took the pennies out of thier cups and recorded the data. For my conclusion I found out that red Gatorade takes the most corrosion off of pennies and that salt water had the most corosion in its glass.

Project Number: MCH038 **Grade:** 8
Title: Efficient Water Electrolysis
Abstract: The purpose of this investigation was to compare solar power and battery power in water electrolysis, a process by which water is separated into hydrogen and oxygen. Water electrolysis is conducted for many uses, including making hydrogen fuel cells and purifying water. The efficiency of electrolysis was measured by comparing the hydrogen and oxygen gas production. The hypothesis states that battery would fare better because it has been used for many years and reached maximum efficiency. The hypothesis was proven wrong because solar power fared better than battery. This experiment shows how solar can be the energy of the future.

Project Number: MCH039 **Grade:** 8
Title: Trace Analysis: Fingerprint Clarity
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH040 **Grade:** 7
Title: Which Flavor last longer?
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH041 **Grade:** 7

Title: Measuring Solubility

Abstract: I had to measure how much of each of my solutes could dissolve into the amount of water selected. I did this to see how much of the solutes would dissolve and how much was left and didn't dissolve. I found out that Epsom salt could take longer to dissolve and that the amount of solute added might affect the way the crystals form.

Project Number: MCH042

Grade: 7

Title: Salt..It Rocks

Abstract: 25 mL of tap water was placed in plastic containers and placed in a freezer for 48 hours before being removed. Seven grams of rock salt, Majestic Ice Melt, Splash Ice Melt, Splash Ice Melt Safe for Use Around Pets and Children, calcium chloride, and sodium chloride were applied to the ice. The ice was placed in a funnel in a graduated cylinder and placed in a freezer. Results were recorded every 5 minutes for a period of 40 minutes.

Project Number: MCH043

Grade: 7

Title: Water, Ions, and Conductivity

Abstract: The purpose of this experiment is to explore the factors that affect the conductivity of water and to test the water quality of various streams, rivers, and lakes located in Western Pennsylvania. After designing and building a conductivity tester, thirty-two water samples were collected and tested. The results showed that the water samples collected from lakes, rivers, and creeks were not conductive. This indicates that these sources of water do not have significant levels of inorganic pollution. The results also demonstrated that temperature and ion concentration have a positive effect on conductivity.

Project Number: MCH044

Grade: 7

Title: Acid Rain and Rust

Abstract: My project was to tell which type of liquid with the most pH levels would make steel Wool rust the fastest. I took 3 acidic liquids, Lemon juice, distilled water, and vinegar. I cut steel wool into individual strips and filled 3 bowls with Lemon juice, and held the steel wool into the lemon juice for 30 seconds, then took it out and put a thermometer through the steel wool, and put that into a test tube, then wrapped the test tube in a cloth and put the whole thing into a cup, and recorded the temperatures for 10 trials for each 1 minute, then repeated the steps for vinegar and distilled water.

Project Number: MCH045

Grade: 8

Title: Which Thermos Would You Prefer?

Abstract: The experiment chosen was how different lined thermoses can retain heat. This experiment was to determine what type of lined thermos held the heat the longest, plastic, glass, or metal lined thermos. The procedure used was to gather the temperatures every 30 seconds until it reached 72°C²F. Some of the data was that the plastic lined thermos held the heat for a little over 5 hours, the glass lined thermos held the heat for almost 11 hours, and lastly, the metal lined thermos held heat for almost 18 hours. Therefore the metal thermos held the heat the longest.

Project Number: MCH046

Grade: 8

Title: Red and Delicious

Abstract: The purpose of this experiment was to preserve apples in different kinds of wrappings to see which wrapping would keep them fresh the longest. Five apples were wrapped in 12x12" wrappings of wax paper, newspaper, and plastic wrap. One apple was put into a baggie and another apple was unwrapped. All of the apples were placed on a plate and were then placed in the refrigerator. The data shows that the apple in the baggie will preserve the apples longest because compared to the other apples, the data shows that the apple was fine, except for some bruises and dents.

Project Number: MCH048

Grade: 7

Title: Enzymes vs. Non Enzymes

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH049

Grade: 8

Title: What Color Is Fire?

Abstract:

The purpose of this experiment was to determine if different metals produced different colors when put to a flame and why. To conduct this experiment, I dipped a Popsicle stick in each powder solution. I waved it through the flame and observed the color. To catch the color, I photographed the flame change for each powder. I then compared the color to the control flame. The results were that each metal produced a different color. The colors ranged from orange to

red to pink. The results indicated that my hypothesis should be accepted because each metal produced a different color.

Project Number: MCH050 **Grade:** 7
Title: Does Dry Ice Sublimate more quickly?
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH051 **Grade:** 7
Title: Time in which Wood Burns
Abstract: The purpose was to determine which type of wood burns the longest. Cut the wood into small pieces and place them in a box, so they would be the same mass. Place paper under the pile of wood, which is dipped in kerosene and burn it. Do those two steps seven times for each type of wood. Then, record the results each time. Oak came in first with an average burn time of 16 minutes, 7 seconds, pine at 13 minutes, 8 seconds, and locust at 7 minutes, 2 seconds. I concluded that oak burned the longest

Project Number: MCH052 **Grade:** 8
Title: When Life Gives You Lemons: Make Batteries
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH053 **Grade:** 7
Title: The "I" of Starch
Abstract: The purpose of my experiment was to determine if foods had starch by conducting an experiment with the known chemical reaction of tincture of iodine to starch (observable color change) and intensity of starch (lighter color change = less starch vs darker color change = more starch). To summarize the procedure, various foods were tested with iodine and observed for color change. In conclusion, there was an easily observed color change in foods with starch and the ability to measure intensity using a color scale. In conclusion, my hypothesis was proven correct.

Project Number: MCH054 **Grade:** 7
Title: The "C" in Orange Juice
Abstract: The purpose of this experiment is to determine which type of orange juice contains the most vitamin C and is the healthiest. To conduct this experiment, an indicator solution was mixed and added to 4 cups of water. Iodine was added, then 10 drops of orange juice. Which ever liquid had the lightest color was the one that had the most vitamin C and the darkest had the least amount of vitamin C. The results were that the freshly squeezed orange juice had the most vitamin C because it had no color. The results indicated that the freshly squeezed orange juice is the healthiest and contains the best source of vitamin C. It is best to drink the orange juice with the most vitamin C in order to stay healthy.

Project Number: MCH055 **Grade:** 8
Title: Which Fabric Softener is more Flammable?
Abstract: To discover if fabric treated with liquid fabric softeners burn less than fabric treated with fabric softener sheets? Three brands tested of liquid softener and softener sheets were Downy, Gain and Snuggle. The fourth brand of liquid was Vinegar and the fabric softener sheets were Seventh Generation Natural. White fabric sheets made of 55% cotton and 45% polyester were used and cut into eighty pieces measuring 15.24cm by 25.40cm. Ten tests were performed with each of the liquid and fabric softener sheets. The Natural Fabric Sheets overall average of burn was the least followed by Snuggle Sheets then Downy Sheets.

Project Number: MCH056 **Grade:** 7
Title: Clean, But Are They Safe:Washing Children's Pajamas
Abstract: I wanted to determine if washing children's flame resistant pajamas with different additives would effect its flame resistancy. I will wash the flame resistant polyester pajamas in different types of laundry additives. My control group will be the pajamas that have not been washed. I will compare the washed sleepwear to the control group by testing the burn time of the fabric.

Project Number: MCH057 **Grade:** 8
Title: Energy Content of Food
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH058

Grade: 8

Title: Supercooling and Snap-Freezing

Abstract: Hello, my project today was on super cooling and snap freezing. The purpose of me doing this experiment was to determine if different types of water can freeze in 20 minutes or less. It was quite easy. You 3 types of water, and then put the water in the cup. Put ice in a bowl and put the water in the cup into the bowl. Then let it sit for 20 minutes then until 1 hour. Data shows that the purified water beat all other types. This science project was fun and exciting. I liked this experiment and recommend it. In conclusion I took the purified water beat all.

Project Number: MCH059

Grade: 7

Title: Cooking Oils and Popcorn Kernels

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH060

Grade: 8

Title: Testing in home Whitening Products

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH061

Grade: 8

Title: Icy Conditions

Abstract: My question was what chemical will melt ice the best. I hypothesized that the rock salt would melt ice the fastest due to the fact that most street departments use it. My procedure started out with me filling nine trays with water and freezing them. Then, I put the chemicals on top of the frozen water and let them sit for three hours, checking it at thirty minute intervals. I recorded th data by holding the tray and the chemical while pouring the amount of water left in the tray. Even though the table salt melted the most ice, it is not cost effective. The rock salt chunks up the ice but the table salt still leaves it in a sheet of ice.

Project Number: MCH062

Grade: 8

Title: Acid and Base Indicators

Abstract: The purpose of my project is to find out what leafy vegetable works best as an acid or base indicator. I also wanted to learn more about acids and bases. My hypothesis is that the red cabbage would work best as an acid indicator. I used different types of leaf vegetables. After fifteen minutes I poured the indicator into seven different clear cups an then I added lemon juice to one, baking soda, vinegar, dish soap, tea, ammonia, and bleach. I recorded my result. I did the same technique for each leafy vegetable. In conclusion, the red cabbage was the vegetable that worked the best.

Project Number: MCH063

Grade: 7

Title: What type of ice cubes melts fastest?

Abstract: I have always wondered what type of ice substance would melt the fastest. How I tested this was I froze four different liquids. After I froze them I put them all in the same area and timed them while they melted. What I found out was that white grape juice melted the fastest with the time of 2:04:39, the coca cola melted with the time of 2:08:41, the orange juice melted with the time of 2:15:40 and water was the slowest with a time of 3:02:5. My conclusion is that the sugar content in a liquid makes it melt faster.

Project Number: MCH064

Grade: 8

Title: The Best Lubricant

Abstract: What is the effect of lubricants on metal? It would be helpful to know what kind of lubricant is the best. It would allow for the least amount of friction. Also it would allow for the most amount of work to be done with the least amount of energy lost as friction. This was tested using two different kinds of lubricants, a liquid and a semi solid. A control of no lubrication being applied to the metal was used. A variable of heat was also added. The semi solid lubricant was better at reducing friction, thus the best for work.

Project Number: MCH065

Grade: 8

Title: Does Oxi Clean Work Too Well?

Abstract: I compared Oxi Clean with five other cleaning agents by testing synthetic blood stained carpet and sprayed each with Blue-Star training luminol to determine which had the least/most residue. I began by placing seven drops of synthetic blood onto seven carpet samples. Second, 20 mL of each different stain fighting solution was sprayed onto each of the samples. Third, each sample was scrubbed for exactly one minute. Last, 2 mL of luminol was sprayed onto each carpet sample to detect residue. Oxi Clean is an investigators worst enemy. It erases all blood evidence.

Project Number: MCH066
Title: The Battle of the Foods

Grade: 8

Abstract: The purpose of this experiment was to determine which of the following (potatoes, tomatoes or lemons) make the best battery. To conduct this experiment, I used a small LED and attempted to light it by inserting galvanized nails and copper into said foods. The results were measured by multiplying the batteries' current by voltage to get the overall wattage. The results showed that while all 3 foods were able to light the bulb, the lemons functioned as the most efficient battery. The results indicate that the hypothesis should be accepted.

Project Number: MCH067

Grade: 8

Title: Hydrogen Fuel Cell Powered By Solar Energy

Abstract: In the experiment I will investigate the hydrogen generation through solar energy powering the hydrolysis process. Three different acid solutions: hydrochloric, acetic, and phosphoric acids will be applied in the hydrolysis process. The results showed that hydrochloric and phosphoric acid produces the same amount of hydrogen which can be used to power a hydrogen fuel cell. The use of acetic acid produces much less hydrogen than the other two acid solutions. However, it has been noted that hydrochloric acid has moderate to high acute toxicity from inhalation; and phosphoric acid is corrosive and it can irritate and burn the skin and eyes. Thus caution should be taken when they are used in the hydrolysis process.

Project Number: MCH068

Grade: 7

Title: Orange Juice Calcium

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCH069

Grade: 7

Title: Speed of Fuels to Turn a Steam Engine Flywheel

Abstract: The purpose of the experiment was to find which fuel would turn the flywheel of a steam engine the quickest. The procedure was to burn fuel under the water tank of the steam engine. Denatured Alcohol turned the flywheel at an average of 761 seconds, Kerosene turned the flywheel at an average of 1214 seconds, and Citronella turned the flywheel at an average of 1425 seconds, proving the hypothesis invalid.

Project Number: MCH070

Grade: 8

Title: Which Vinegar Produces the most Carbon Dioxide?

Abstract: The purpose of the investigators experiment is to find out which vinegar mixed with baking soda will make the most CO₂. The investigator used apple cider vinegar, white distilled vinegar, red wine vinegar, and rice vinegar. Then the investigator put the vinegar in a bottle and the baking soda in the balloon. Then she put the balloon over the top of the bottle and let the balloon inflate and then take off the balloon and put it in water and then record the water level. The investigator recorded the data. The investigator concluded that white distilled vinegar.

Project Number: MCH071

Grade: 8

Title: Name brands vs Generic

Abstract: My project is If you shake up name brand vs generic brand soda, which will have the most left? The purpose of my project was to find if name or generic brand sodas would have the most left if shaken up. I based my experiment mainly on the sugar level in each soda. There were four sodas, Pepsi, Cherry Coke, Black Cherry Faygo, and Clover Valley Cola. I shook up each bottle for five seconds each, and then opened them. I then measured the amount left in millimeters. Faygo was the winner, then Pepsi, Clover Valley, and last was Cherry Coke.

Project Number: MCH072

Grade: 7

Title: Potato or Lemon?

Abstract: In my experiment, I have tested 4 halves of a potato and four halves of a lemon to see which would have the most voltage when I tested them with galvanized iron and copper. My hypothesis was that the lemon would have the most voltage, because it is more acidic than the potato. My experiment proved me right. The lemons powered 3.63 volts, while the potatoes powered 3.11 volts with each varying in the hundredths of a volt. In conclusion, in a test of volts the lemon will power more than the potato.

Project Number: MCH073

Grade: 8

Title: To Drink or Not To Drink

Abstract: The purpose of my experiment was to see if these so called pure water bottles are really that pure. I also wanted to know the pH of our home well tap water.

Intermediate Computer Science / Math

Project Number: MCM001

Grade: 8

Title: Probability of Guessing in a MCQ Test

Abstract: Probability of Guessing in a MCQ Test: Question: What is the probability of guessing correctly 10 Multiple Choice Questions (each containing 4 responses)? Method: Randomly guessed 10 MCQs using a computer program.

This process was repeated 10 times. Average correct responses used for the calculation. Experimental probability - obtained from study results (Average correct answers/10). Theoretical probability - using formula

Binomial probability - calculated using a Binomial Calculator. Results

Experimental Probability – 22% Theoretical probability - 25%

Binomial Probability

Probability of getting 100% on one test– $9.57e-7=0.00009\%$

90%– $0.000286=0.002\%$

80%– $0.00386=0.03\%$

70%– $0.00308=0.3\%$

60%– $0.0162=1.6\%$

50%– $0.0583=5.8\%$

40%– $0.146=14.6\%$

30%– $0.250=25\%$

20%– $0.282=28.2\%$

10%– $0.187=18.7\%$

0%– $0.0563=5.6\%$

Over a 50%– $0.0781=7.81\%$

Project Number: MCM002

Grade: 8

Title: Coloring Circles

Abstract: Given a circle divided into S sections and C colors that those sections can be colored with, what is a formula, in terms of S and C, for how many different ways there are to color the circle, if rotations of a coloring are not considered distinct?" My project was to solve this problem. After attempting many approaches, and learning some new mathematics, such as some elementary group theory, I finally found a formula that works all the time.

Project Number: MCM003

Grade: 8

Title: Preventing Cyber Bullying in Instant Messages

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCM004

Grade: 8

Title: Digital Music and Sampling

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCM005

Grade: 8

Title: Subconscious Desktop System Rating

Abstract: The operating system is the software that allows all applications to run and communicate on the most basic level, without the operating system no computer could run. In this experiment I used excel to make a binary/decimal/hexadecimal converter and compared the operating systems of Microsoft XP with Excel '07', Excel '03' and Linux's UBUNTU with Openoffice spreadsheet. To determine the operating system subconsciously preferred by a middle school population, 25 individuals were sampled to rate the performance of the converter. The results showed the converters on Excel '03' and Openoffice spreadsheet tied for the highest ranking, the '07' ranked last.

Project Number: MCM006

Grade: 8

Title: The Law of Large Numbers in Galileo's Passedix Game

Abstract: Bernoulli's law states, as the number of repetitive events increases, results approach those statistically predicted. My experiment's purpose was proving this law using the dice game, Passedix. Rolling three dice per toss, all results are recorded. Number of nines and tens rolled after 4,000 tosses are compared. Results indicate more tens were rolled than nines as hypothesized. Increasing repetitions, however, did not show results approximating those statistically expected. Future research would include testing the fairness of the dice, using different sets of dice, and increasing the number of tosses so the repetitions are greatly increased.

Project Number: MCM008

Grade: 8

Title: Outcome of the Rainbow

Abstract: The purpose of this experiment was to find out what the most common color of skittles in an individual bag. Five trials were performed. Each trial consisted of an individual bag. The data concludes that .22 were green, .22 were red, purple had a total of .28, and .10 were orange. Therefore purple has the greatest amount shown. This experiment concludes that the manufacturers, could possibly purposely make the most common color purple, due to the most favorable color. Surveys have been taken to see which color is preferable. In this case manufacturers may purposely choose this color.

Intermediate Consumer Science

Project Number: MCS001

Grade: 8

Title: Hot! Hot! Hot!

Abstract: The Purpose of this experiment was to observe which brand of hand warmers works the best. Three different brands were used and the temperature of each was measured over a period of time. When the packets were first opened the Grabber Warmer Brand was the hottest. Little Hotties reached the highest temperatures of 62.8°C at twenty minutes. Hot Hands worked for the longest amount of time at a constant temperature. The hypothesis was proven to be correct. If this experiment was done again the external or "room" temperature at which the warmers were tested would be measured.

Project Number: MCS002

Grade: 8

Title: Light It Up

Abstract: This project measures the brightness and energy of two brands of energy efficient compact fluorescent light bulbs. In my procedure I built a box with a removable top. I plugged in my Extech light meter and Kill-A-Watt energy meter. I tested 6 GE light bulbs and 6 generic Great Value bulbs. I measured the brightness and energy used every 2 minutes for 10 minutes. The Great Value (GV) used more energy and was brighter than the GE. The GV bulbs are a better choice because these bulbs produce more light, but use slightly more energy.

Project Number: MCS003

Grade: 8

Title: Plastic Milk

Abstract: The purpose of my experiment is to find out what type of milk makes the strongest plastic. Also, I want to prove whether or not the consistency of the curds comes from fat. First, I heated a sauce pan on medium and added a pint of milk to simmer. Then I added vinegar to make the milk curdle. I think that the whole milk will make the strongest curdles. All in all, my experiment ended not how I expected but instead I learned that the strength of a curd does not come from fat but from its contents in general.

Project Number: MCS004

Grade: 7

Title: Amounts of Sugar In What We Drink

Abstract: The purpose of this experiment was to determine which drinks contain more sugar than others, therefore making them unhealthy. To do this I read labels or looked online for the amount of sugar contained in various common drinks. In conclusion many of the drinks that many kids my age and I enjoy contained a very high amount of sugar in them. I expected soft drinks to have the highest amount. However, some drinks such as fruit punch and a frappuccino had a surprisingly high amount of sugar.

Project Number: MCS005

Grade: 7

Title: Is Going Green Really Worth It?

Abstract: The title of my project is, Going Green Really Worth It? What I wanted to find out is if eco-friendly laundry detergent worked better than regular laundry detergent. My hypothesis was that the regular laundry detergent would work better than the eco-friendly laundry detergent.

During my testing I went through different steps such as having to stain my pieces of cloth with ketchup and then putting them through the washing machine and repeating twice more.

In conclusion my testing fell flat because the laundry detergent had really no difference in the cleaning area except the eco-friendly laundry detergent helps the environment and is a bit more expensive.

Project Number: MCS006

Grade: 8

Title: Is Dilution a Solution?

Abstract: Paper discs were punched with a hole punch and sterilized in an oven set at 149 degrees Celsius for 2 hours. They were soaked in a 100% dilution of each of the products tested for 5 minutes and allowed to drip for 15 seconds and placed in an agar plate streaked with Staphylococcus epidermidis, placed in an incubator for 48 hours

before being removed and the zone of inhibition was measured. This was then repeated for Escherichia coli and a 99%, 95%, and a 90% dilution.

Project Number: MCS007

Grade: 8

Title: Tooth Sleuth

Abstract: I performed an experiment to test whether manual or electric toothbrushes removed stains from teeth more effectively. I tested this by brushing stained calcium-deficient hydroxyapatite discs, a tooth substitute, with manual and electric toothbrushes for one minute, three times per disc. My results showed that manual toothbrushes cleaned teeth more effectively than electric toothbrushes, though my data was not statistically significant. If I were to run this experiment again, I would test the toothbrushes using different stains or bacteria on the discs.

Project Number: MCS008

Grade: 8

Title: Effect of Smell on Taste

Abstract: How does the sense of smell influence the sense of taste? If a person has a cold, it could influence the way they taste food. To determine whether smell affects taste, a group of students were asked to taste a flavored potato chip and identify the flavor correctly blindfolded and with their noses plugged. A second group was asked to do the same thing, but only wearing a blindfold. The second group of people had a larger amount of correct guesses than the first group. My research proved that the sense of smell does influence the sense of taste.

Project Number: MCS009

Grade: 7

Title: Durability of Paint

Abstract: Knowing the most durable paint could save you money in the future. In this experiment, I used Behr (most expensive) latex gloss and flat, Rust-oleum oil-based gloss and flat, and Valspar latex gloss and flat. I primed and painted 12.7 cm x 12.7 cm square pine wood boards with the different paints. I put aside the control boards. I designated three additional groups: A, B, and C. Group A went to the heating unit, group B went to the freezer, and group C went into acid rain, all for four days on a continuous cycle, 15 trials in 60 days were conducted. I calculated the amount of chipping after testing. Behr gloss was the most durable, possibly because latex gloss paint is flexible and contains more acrylic than flat paint.

Project Number: MCS010

Grade: 8

Title: Fabrics, Softeners, and Flammability

Abstract: I selected this experiment hoping to show that fabric softeners can be dangerous. I constructed my apparatus and took each one of my fabric squares and washed half with softeners and half without. Then I tested my squares and recorded my data. I found that softeners do affect the flammability of fabric. In conclusion I'd like to say that my hypothesis was correct and was supported by my results. I would like to continue this experiment if I could. I believe many others would find this data helpful.

Project Number: MCS011

Grade: 7

Title: Bubbled Up by Growing Yeast

Abstract: This project tests the effect of different sweeteners on yeast metabolism, which was measurable by collecting gas made by yeast. The yeast was expected to utilize the natural sugar best. A gas over water collection system was used to measure the produced gas. Room and solution temperatures along with ingredients were carefully controlled. The data showed the natural sugars performed best overall, but saccharin did better than most of the natural sugars and all other artificial sweeteners. The data supported my hypothesis. Two of the natural sugars tested produced more gas at a faster rate than all others.

Project Number: MCS012

Grade: 8

Title: Lett-uce Test the Best

Abstract: The purpose of the experiment was to determine the best way to preserve lettuce. First, rinse the heads of lettuce lightly. Then, place one head of lettuce in a Tupperware container, one head in a freezer Ziploc bag, one head wrapped twice in plastic wrap, and one head of lettuce in no container. Put all heads of lettuce into the refrigerator. Observe lettuce for 14 days. The Tupperware container preserved the lettuce the best, then the freezer bag had the next best performance, then the Ziploc bag, next was the plastic wrap, and the lettuce in no container performed the worst.

Project Number: MCS013

Grade: 7

Title: Protein Solubility of Beans

Abstract: Beans are a very common food with enriched plant protein. This study is to answer the inquiry how different is the water solubility of the proteins in different beans, and which bean soup has the highest protein

concentration? In order to answer the question, five common beans, including Large Lima, Soy, Green Split Pea, Kidney, and Pinto beans were boiled or soaked in water for a various periods of time, and the protein concentration in the bean soups and soaking water was then measured by protein assay. The results demonstrated that the water solubility of the bean proteins is different. The protein in the green split pea has the highest water solubility and thus the green split pea soup has the highest protein concentration.

Project Number: MCS014

Grade: 8

Title: Facial Cleansers

Abstract: Sterilize workspace, metal forceps, a hole punch, and a nicrome wire loop in rubbing alcohol for 30 seconds. Create paper disc. A Petri plate was divided into 4 quadrants and streaked with Staphylococcus epidermidis. 2 mL of each product will be dissolved in 15 mL of tap water. Discs were soaked for 30 seconds and allowed to drip for the same length of time. Plates were taped shut, inverted, and placed in an incubator set at 37 degrees C for 48 hours before being removed and the colonies were counted.

Project Number: MCS015

Grade: 7

Title: Diaper Absorbency

Abstract: Do certain brands of diapers absorb more water than the others? It is hypothesized that Huggies brand diapers will absorb more than Pampers and Luvs brand name diapers. A brief procedure of the experiment is as follows. Water was poured on each diaper, the same amount of water the same amount of times. The amount of water poured on the diaper was measured in ounces. The amount of tests taken was four. Data was taken and recorded. The results did not support the hypothesis.

Project Number: MCS016

Grade: 7

Title: VOLT

Abstract: The purpose of my experiment was to find out which electrolyte solution conducts the most electricity. I attached a spring I made to a Styrofoam ball that was connected to a stack of books. Then I connected insulated wire to a battery and the pan. Then I observed the bubbles produced. Propel showed the most bubbles and Pedialyte created the least.

Project Number: MCS017

Grade: 7

Title: Please Keep Me Cold

Abstract: This report is about which cooler metal, plastic, or portable cooler cools 2 bottles of water the best in 1 hour. It has the graphs that I made and it also has pictures of the 3 coolers that I used. This report also explains to you the average temperature of the water in one hour. It contains the table of contents, which gives you all the pages and page numbers. It also has the people and websites that helped me.

Project Number: MCS018

Grade: 8

Title: Iron in Cereal

Abstract: The purpose of this experiment was to see if cereal claims of iron content add up. The data indicates that both cereals have a content exceeding the amount of 18 mg.

Project Number: MCS019

Grade: 8

Title: Efficacy of Laundry Detergents

Abstract: Are expensive detergents better at cleaning your clothes? A simple experiment was performed to confirm. Six different types of stains were made on a piece of white cloth. Digital photographs were taken before and after washing with six different detergents. A measure called the Cleanliness Index was defined based on the RGB values of a camera image to measure each detergent's cleaning ability. The experiments and analysis proved that expensive detergents are not better at cleaning than cheaper ones. Amongst the detergents tested, the mid-price range detergent, Arm and Hammer Oxi Clean performed the best.

Project Number: MCS020

Grade: 8

Title: The Electrolyte Challenge

Abstract: The purpose of my experiment was to find the amount of electrolytes in different sports drinks. I chose this because I wanted to see what sport drink was the best. for my procedure I put together a sensor that measures voltage in drinks. After I got the reading on the multimeter I recorded it in my data book. My data showed me that Gatorade is the best because it had the highest voltage. Powerade and the homemade drink were right behind it for second place and the last on was Vitamin water

Project Number: MCS021

Grade: 7

Title: Oh So Permanent!

Abstract: The purpose of me doing the experiment was to see what solutions removes the permanent marker the most from the cloth. I put marker onto a cloth and poured different solutions on top of it. The results of the project was that the nail polish remover removed the most permanent maker from the cloth.

Project Number: MCS022

Grade: 8

Title: Ultraviolet Light Sterilization of Commonly Touched Household Areas

Abstract: The purpose of this experiment was to see how well ultraviolet light wands sterilize commonly bacteria ridden household areas. Another objective was to find out which commonly touched household area was the dirtiest. Microbiologists and consumer scientists would be interested in the results.

Project Number: MCS023

Grade: 8

Title: What Wood is Affected The Most By Water

Abstract: I selected this topic because we were working with wood in tech. ed. and I wanted to learn more about it. I hoped to prove that softwood will be affected by water more than hardwood. In my experiment I first cut out twenty five blocks of these types of wood: balsa, bass, pine, cherry and oak. I then measured and weighed them again. Basswood was most affected then pine, oak, balsa and finally cherry. My hypothesis was not supported by the data.

Project Number: MCS024

Grade: 7

Title: Comparing Carpet Cleaners

Abstract: I am comparing three different carpet cleaners, to see what carpet cleaner would remove the stain the best. Two carpet cleaners are from the store and the third one is a home remedy. I came up with this idea because I wanted to know what the best stain remover was.

Project Number: MCS025

Grade: 8

Title: Custards=Egg Coagulation

Abstract: My experiment was about the influence of heat on the coagulation of egg proteins. My hypothesis was that the more heat introduced the more solid the egg proteins will be. For my experiment, I made custards. I made my control batch at 350°F. I evaluated them and made the next batch by raising the temperature to 375°F. I repeated the evaluation process and made the next batch at 400°F. Again, I repeated the evaluation process. For my final batch, I made the custards at 425°F. I repeated the evaluation process a final time. My hypothesis was both correct in some areas of the evaluation and incorrect in others.

Project Number: MCS026

Grade: 7

Title: What Golf Ball Rolls the Farthest

Abstract: The purpose of my experiment was to see what golf ball would roll the farthest. I built a putting mechanism, used it to hit the golf balls in my experiment, and then measured the distance that they rolled. After testing nine different golf balls, I concluded that the Titleist NXT ball was farthest roller of the group on the green. An experimental error would be slope of the green, a human error would be in the measurements. Another question may be which model of the same brand golf ball rolls the farthest.

Project Number: MCS027

Grade: 7

Title: Arrow Penetration

Abstract: Arrow Penetration

The purpose of this project was to find which arrow carbon, wood, and aluminum would penetrate a hay bale the farthest. A two foot draw line was drawn on all three arrows. A carbon, aluminum, and wood were shot for three trials from forty yards at two hay bales. The arrows were marked and measured. The hypothesis was proven false. The hypothesis stated the carbon arrow would penetrate the farthest. The aluminum arrow penetrated the hay bale the farthest averaging 14 19/48 inches; the carbon arrow averaged 11 7/8 inches; the wooden arrow averaged 10 23/24 inches.

Project Number: MCS028

Grade: 8

Title: The Effect of Highlighting Products on Human Hair

Abstract: I constructed this science fair experiment to determine what highlighting product would cause the most split ends on human hair. My procedure while experimenting was to separate 25 strands of hair for all five variables. I looked at every strand under the microscope to look for split ends and record my data. The data was as follows, Clairol and Garnier Nutrisse at the least amount, then lemon juice, and finally Revlon and hydrogen peroxide.

Project Number: MCS029 **Grade:** 8
Title: Which Bandage Lets in the Least Amount of Air?
Abstract: My purpose of this experiment was to help people with everyday life and to find out which bandage is best. While doing this experiment, I hoped to prove that it would help people protect their wounds better. I would also like to help others save money. The conclusion to my project was that Assured let in the least amount of air and Top Care let in the most. Therefore, my hypothesis was wrong. The outcome of my experiment was shocking. I also think that others will be interested in my result because they can benefit from it.

Project Number: MCS030 **Grade:** 7
Title: Long Lasting Batteries
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS031 **Grade:** 8
Title: Which detergent works the best?
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS032 **Grade:** 7
Title: Iron Breakfast
Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS033 **Grade:** 8
Title: Which Wood Glue Is The Strongest
Abstract: I selected this project because I was interested in learning which brand of glue is the strongest in order to help carpenters do their job with the best materials. I glued two pieces of wood together and then hung a weight on one piece until the pieces separated. I performed these tests several times for each brand of glue under three conditions. Based on the results of my experiments, Titebond proved to be the strongest glue under all conditions. In conclusion, some brands of glues are much stronger than others under different conditions.

Project Number: MCS034 **Grade:** 8
Title: Are You Rotten Yet?
Abstract: The purpose of my experiment was to figure out what method of fruit preservation is best. In my experiment I cut up an apple and used five different preservation methods: lemon juice, forever-bag, 7-up, fruit-fresh, and natural. To get my data, I weighed each apple slice three times a day to see which apple was preserving the most weight. But, I also took photos of each apple three times a day to get visual information. My conclusion was that the forever-bag was the best method of apple preservation because it lost the least amount of weight and discolored very little.

Project Number: MCS035 **Grade:** 8
Title: Get Sticky!
Abstract: I decided to do this science fair project because I wanted to do something that would help others and would be fun. By doing this experiment, I am hoping to prove which glue will hold the most weight with wood. I did this by gluing together two pieces of wood held in C-Clamps, letting them sit for 20 minutes, and then putting weights into a bucket hanging under the wood until the pieces broke apart. I found the Elmer's was the best and Harvard was the worst.

Project Number: MCS036 **Grade:** 7
Title: To Wash or Not to Wash
Abstract: There are multiple washing methods to wash Lycra. During this project, Lycra was put into chlorinated pool water, then each Lycra strip was individually washed in either Tide, cold water only, or unwashed. After that, each strip was stretched on a spring scale. At the end of this process, the Lycra material that was washed in cold water stretched the least. This concludes that washing Lycra in cold water only will reduce stretching.

Project Number: MCS037 **Grade:** 7
Title: Paper Towels: Who is Mr. Absorbency
Abstract: Which paper towel brand is the most absorbent to water and other products? It is hypothesized that Bounty paper towel compared to other brand paper towel will absorb liquids such as: water, oil, pasta sauce, and nail polish remover. A brief procedure of the experiment is as follows. Bounty and Viva paper towels were placed in bowls

containing the following ingredients that were described in the list of materials. A timer was set for one minute to test the absorbency of each paper towel individually. Each paper towel was dipped in the ingredients and the time was set. All tests were repeated for six weeks. That is, six tests were for each of the following: one-fourth cup of the above ingredients and ending the experiment at one and one third cup of the above ingredients. The data was taken and recorded. The results do not support the hypothesis.

Project Number: MCS038

Grade: 7

Title: Pain Reliever's Dissolvability

Abstract: Which brand of over the counter pain reliever dissolves the fastest in stomach acid? It is hypothesized that the generic brand of pain reliever will dissolve faster than Tylenol, Motrin, or Advil. A brief procedure of the experiment is: Four cups were each filled with 1/3cup of distilled white vinegar. One brand of pain reliever was placed into each cup. Then they were timed to see which one completely dissolved first. The times were recorded. The test was repeated once a week for six weeks. The results did not support the hypothesis.

Project Number: MCS039

Grade: 8

Title: What stain cleaner is the best for stains?

Abstract: The purpose of the investigator's project was to see what stain remover would remove stains the best. The investigator tested Oxi Clean, Shout, Spray n Wash and Clorox Bleach. The investigator picked three popular tough stains: BBQ sauce, ink and coffee. He used white cotton as his fabric. The investigator concluded that the Oxi Clean worked the best.

Project Number: MCS040

Grade: 8

Title: What Cleaner Cleans the Best?

Abstract: The purpose of this investigator's project was to see which cleaner cleans tile floors best. The investigator tested Pine-Sol, Clorox Bleach, and Mr. Clean. She tested these cleaning products on a piece of tile. She used one side of the tile for testing and the other side was used as the control. The investigator cleaned a marker line off of each tile with each of the cleaners. The investigator concluded that the Mr. Clean cleaner worked the best on the tile floor.

Project Number: MCS041

Grade: 8

Title: Going, Going, Gone!

Abstract: This project will show how baseballs from different companies compare in terms of distance when people try to hit a ball for distance. Different baseballs fly farther when struck by a wooden bat. This theory will be tested by creating an apparatus that will hit each ball in the same way at the same speed. The baseball that went the farthest was the Rawlings; it went an average of 69 ½ inches, followed by the Wilson at 67 ¾ inches, then by the Reebok at 65 ½ inches, and finally by the Pro Sport at 64 ½ inches.

Project Number: MCS042

Grade: 8

Title: Sugar in Children's Vitamins

Abstract: The purpose of this experiment was to determine which children's multivitamin contained the highest glucose content. I crushed different vitamins and submerged them in hot water, then i use glucose testing strips to test for glucose. Welby Gummy Children's Vitamins contained the most glucose

Project Number: MCS043

Grade: 8

Title: Quit Counting Sheep!

Abstract: One sleep aid capsule will be crushed and dissolved in 1 L of distilled tap water. 50 mL of the solution will be added to 50 mL of tap water. The heart rate of one hyalella azteca will be counted before exposure to the sleep aid as well as after 5 minutes of exposure to determine the effect of the various products used in this investigation.

Project Number: MCS044

Grade: 7

Title: Clean up? or Ketchup!

Abstract: My experiment was to determine which detergent removes ketchup stains best so as to help people choose detergents. I stained each piece with the same amount for the same time. I washed each sock individually in each detergent. In the first trial I did not press the ketchup into the socks, in the second trial I did. The data showed Tide did the best at removing stains. Then Method, Oxi Clean, Water only and Gain tied for worst results. My hypothesis was correct. I had concluded, based on my research, that Tide would do the best at removing the stain.

Project Number: MCS045

Grade: 7

Title: Perilous Paint

Abstract: The purpose of "Perilous Paint" is to test the three leading brands (Benjamin Moore, Behr Premium Plus, and Valspar American Tradition) and one local brand of house paint (Pittsburgh Paints) for volatile organic compounds (VOCs). VOCs can cause both short-term and long-term health effects. To conduct this experiment, I poured a designated amount of paint into an aluminum foil dish. I weighed the sample and heated it in the oven at 230 degrees Fahrenheit. I weighed the sample again. The percent volatile was calculated from the loss in weight. I concluded that Pittsburgh Paints paint had the highest percent volatile.

Project Number: MCS046

Grade: 7

Title: What juice cleans pennies best?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS047

Grade: 7

Title: Keep your sandwich dry

Abstract: The purpose of this experiment is to determine which plastic baggie keeps out the most moisture. To test this, I placed a slice of bread in four different plastic bags. I placed the bag in iodine and let soak for an hour and a half, and hour, and a half hour. I measured how much iodine was absorbed by the bread. My results were: a cheaper bag did better than two expensive bags and one cheaper bag. An expensive bag did better than a cheaper bag and an expensive bag. One of the cheaper bags did better than two of the expensive bags.

Project Number: MCS048

Grade: 8

Title: Clean as a Whistle

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS049

Grade: 8

Title: What Brand of Volleyball Goes the Farthest?

Abstract: The purpose of my experiment is to find out what brand of volleyball goes the farthest when it's hit. For my science fair project, I wanted to do something that involved volleyball. I did this experiment by using five different brands of volleyballs with the same air pressure. A clay pigeon thrower hit the volleyballs and I measured how far that each volleyball traveled. I did this twenty-five times with each volleyball. I found out that the Wilson volleyball was the ball that traveled the farthest. Therefore my hypothesis was wrong.

Project Number: MCS050

Grade: 7

Title: Accuracy of Airsoft Guns

Abstract: The purpose of this experiment is to find out which air soft gun is the most accurate. First, set the target 6m away from the firing point. Then, use a laser to direct a bulls eye from the gun to the target. Next, use a clamp to clamp it down and fire 7 times. The data shows that the M-4 was the most accurate and the pistol and shotgun tied for second place.

Project Number: MCS051

Grade: 7

Title: Which type of pop has the most fizz?

Abstract: What I did was find out which type of soda pop, of five types, contained the most carbonation. How I tested it was I strapped balloons on top of each open bottle and shook each one for exactly five seconds, timed by a stopwatch, and measured the diameter of each at full inflation. But then reduced the level of pop in each by one fourth and repeated my experiment with new balloons. The average diameter of the balloons after both tests are; Coca-Cola: 51cm, Root Beer: 48cm, Ginger Ale: 48cm, Pepsi: 48cm, Sprite: 48cm. This means Coca-Cola contained the most.

Project Number: MCS052

Grade: 8

Title: Loco Litter

Abstract: I chose this topic because I wanted to find out whether my family was actually paying for quality Guinea Pig litter or if we were paying for brand names. I did this experiment by adding a specific amount of water to 5 cups of litter and measuring the output. My data was conclusive. The pink litter held all 30mL of water as did the pellet litter. The wood chips held 22mL of water, the Earthfriendly held 26mL and the newspaper held 10mL. People will benefit from my project because it will help them choose Guinea Pig litter.

Project Number: MCS053

Grade: 8

Title: Does Enamel Shield Rinse Protect Your Teeth?

Abstract: Acidic beverages cause harm to teeth, but is that damage preventable? This purpose of this experiment was to test the effectiveness of Crest Pro Health Enamel Shield Rinse in the prevention of tooth decay. Eight sterilized teeth were obtained from a dentist. Prior to experimentation, each tooth's mass was measured. Also, x-rays were taken, and the length and width of the enamel of each tooth was measured on the x-ray with a digital caliper. Three teeth were then immersed in different acidic beverages for 10 days, with one tooth as a control. Three different teeth were immersed in Crest Pro Health Enamel Shield Rinse for 24 minutes, followed by 24 hours in the same three acidic beverages used in the first test; this was repeated 10 times. This test also had a control group. The pH of each beverage was tested initially and daily. Each tooth's mass was again measured and x-rays were taken of each tooth. The length and width of the enamel of each tooth was again measured on the x-ray with a digital caliper. My research found that phosphoric and citric acid cause enamel loss, but Crest Pro Health Enamel Shield Rinse reduces the amount of damage done to enamel from acids.

Project Number: MCS054

Grade: 7

Title: Battle of the Batteries

Abstract: Please visit student's exhibit for the abstract.

Project Number: MCS055

Grade: 8

Title: The Biggest Cookie

Abstract: For my science fair project, I compared the size effect of different fats on sugar cookies when they are baking. The fats I used were butter, Crisco, margarine and lard. I chose to do this project because I wanted to know what kind of fat to use if I wanted to make big cookies. The cookies made with lard spread the most with an average size of 19.42cm and the margarine ones were the smallest. I think they spread the most because they were pure fat and the other three were made with other ingredients too.

Project Number: MCS056

Grade: 8

Title: The Way The Ball Bounces

Abstract: The purpose of my experiment is to see what ping pong paddle rubber will make the ball travel the furthest while in a fixed position. First, I built a Spring Action Catapult to shoot the ball at the paddle. The paddle was leaned on a wall at a 60 degree angle. The data I gathered was not what I expected. Some of the paddles I expected to do bad ended up being better than the paddles I expected to be good. I concluded during the experiment that some paddles put too much spin on the ball to go that far.

Project Number: MCS057

Grade: 7

Title: Pie Crust

Abstract: The purpose of my experiment was to find whether a recipe using water or 7-Up would make a fluffier pie crust. During my research I found that using air bubbles makes flour rise. 7-Up is a carbonated water and carbonated water has air bubbles. From that research, I hypothesized that the pie made with 7-Up would have a fluffier crust. To test my hypothesis, I made six pies. Three of those pies were made with 7-Up, the other three were made with water. Then I measured each of the pie crusts before and after they were baked. I also had ten people judge on which tasted fluffier. The results of my experiment were that the pies made with 7-Up did have a fluffier crust.

Earth / Space / Environment - Intermediate

Project Number: MES001

Grade: 7

Title: Acid Rain

Abstract: Why are buildings crumbling? Why are plants dying? Why is the weather changing? The effects of acid rain are becoming worse. The work and value of this study is to show the possible deterioration of buildings, materials and plant life. Precipitation samples were collected three times each month for one year and tested for their acidic properties. The data collected over the year of study showed that the acidic levels did not change in the research area. So, therefore the time is now to find building materials and plant life that could sustain the effects of acid rain.

Project Number: MES002

Grade: 8

Title: Biodegradable Baits

Abstract: Please visit student's exhibit for the abstract.

Project Number: MES003

Grade: 8

Title: Detergent Dilemma

Abstract: The purpose of this experiment was to determine if using the recommended amount of homemade laundry detergent is adequate at getting clothing as clean as possible. First, 9 socks were soaked in a homemade dirt solution. Then, each sock was individually washed using less than (125 ml), more than (175 ml) and the recommended amount (150 ml) of homemade laundry detergent. The data collected was that using less than the recommended amount (125 ml) did not perform as well as using the recommended amount (150 ml) and using more than the recommended amount (175 ml) performed equally as the recommended amount. Therefore, it is economically and environmentally friendly to use the recommended amount of homemade laundry detergent.

Project Number: MES004

Grade: 7

Title: Which Fence Best Stops Sand Erosion

Abstract: The purpose of this experiment was to answer "What type of fence design will best stop sand erosion?" The hypothesis was if vertical, horizontal, diagonal to the right, and diagonal to the left fences were tested then the horizontal fence should stop the most sand because of the bottom slat. Procedures used in this experiment included constructing four fences, a testing lane, and collecting the amount of sand that was stopped by each type of fence. Review of data indicated that the vertical fence stopped the most amount of sand and the hypothesis was proven incorrect.

Project Number: MES005

Grade: 8

Title: Ready? Set, Burn!

Abstract: In my project I tested which oil would produce the most energy. I tested corn, peanut, and #30 motor oil. I hypothesized that corn oil would produce the most energy, peanut oil would be the second most, and #30 motor oil the least. I dropped twenty drops of each oil on a cotton rope, placed it under a stand which held a can of water, lit the rope, and let it burn. I recorded the initial temperature and the final temperature of the water. Then I used the formula: $\text{energy} = \text{mass} \times \text{change in temperature} \times \text{specific heat}$. I did this for each of my trials. In conclusion my hypothesis was incorrect. Peanut oil produced the most energy (9 calories), corn oil produced the second most amount of energy (7.5 calories), and #30 motor oil the least (7 calories).

Project Number: MES006

Grade: 8

Title: Does Global Warming effect Temp. around the world?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MES007

Grade: 8

Title: Lime Dosers: Turns for Streams

Abstract: Many streams in our region are orange due to acid mine drainage. Lime dosers are often used to improve water quality in these streams. This experiment tested to see if lime dosers are effective. Water samples were collected above and below a lime doser. The pH of the samples was then tested using a pH meter. The average pH of the water above the lime doser was 5.6. The average pH below the lime doser was 6.1. There was an average difference in pH of 0.5. Based on the results, a lime doser does increase the pH of acid mine drainage, causing streams to be less acidic.

Project Number: MES008

Grade: 7

Title: A Brighter Shade of Gray

Abstract: My purpose for doing this project was to understand if the most popular types of grey water generated by a household could be recycled for other uses. Using several types of common grey water, I watered pieces of sod every three to four days, each with one type of water. I recorded the height and visual aspects into a notebook. My results showed that, on average, the dishwasher grey water caused grass to grow the best, while grass watered with the cooking grey water grew the worst. Overall, the sod grew more than I expected. My project taught me that gray water can be recycled for landscaping and can replace tap water when irrigating plants.

Project Number: MES009

Grade: 8

Title: Fish Kills and Golden Algae

Abstract: In August, 2009, thousands of fish were killed due to a sudden growth of algae in Dunkard Creek, PA and WV. This experiment was intended to discover if acid mine run-off, fertilizer run-off, or the salty by-product of gas well drilling led to the growth of golden algae. To test my theory that the salty by-product was responsible, I placed two ml of algae, thirty-one ml of distilled water, and one ml of salt, acid, fertilizer, or distilled water into each of the four dishes. I then recorded the algae's mass, volume, and density for two weeks. This investigation's results showed that

salt leads to the greatest growth of golden algae, which suggests that the cause of the fish kill was the improper disposal of the salty by-product of gas well drilling.

Project Number: MES010

Grade: 8

Title: The Effect of Blades on Windmill Efficiency

Abstract: I selected this topic because I was curious if a specific number of blades affected how long a windmill took to start moving. I was hoping that the fewer number of blades you have would make the windmill start faster. I built a windmill and tested each number of blades 25 times. The data I received was that the 8-blades windmill worked the best. This is not what I was predicting in my hypothesis. I expected the 3-bladed windmill to start the fastest. The conclusion that I reached was that the 8-bladed windmill worked the most efficiently.

Project Number: MES011

Grade: 7

Title: The Greenhouse Effect

Abstract: To see if the greenhouse effect can make plants larger and grow quicker so that farmers can grow food faster and make more money. I will plant plants in plastic bottles. Put a thermometer in each bottle. Cover half of the bottles with plastic wrap. Place these plants in sunny spot. Measure and record observations and results.

Project Number: MES012

Grade: 7

Title: Sun Spectacular

Abstract: This experiment studied variation of sunrise or sunset colors with ozone counts and the weather. I expect gray days to have higher counts. Sunrise and sunset data were recorded daily; a picture was also taken. Tables and graphs showed the sunrise and sunset to be related to certain factors. At sunrise, days with highest morning precipitation had highest ozone counts. Main sunrise colors of orange and yellow had higher ozone counts. For sunset, cloudy days had worse ozone counts. Red and pink sunset colors had higher counts. Ozone data was related to sunrise and sunset color and the weather.

Project Number: MES013

Grade: 7

Title: Does the moon affect your mood?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MES014

Grade: 8

Title: Heat Wave!

Abstract: The title of my experiment is "Heat Wave". My question was "Do different levels of carbon dioxide affect the temperature of the air?". I gathered my materials and conducted my experiment. I added different amounts of baking soda in three different bottles. I then added equal amounts of vinegar and a thermometer into each bottle and quickly screwed on the caps. I had two empty bottles, one with a cap on, and one without. These were my controls. I set all the bottles outside for a half an hour and took their temperature readings. In conclusion I found different amounts of carbon dioxide do not affect the temperature of the air.

Project Number: MES015

Grade: 7

Title: Effect of Pollutant Concentration on Daphnia

Abstract: Daphnia are tiny, freshwater crustaceans that live at the bottom of ponds and streams. These microorganisms are affected by water pollution including runoff from yard chemicals. This experiment tested five concentrations each of fertilizer, herbicide, and pesticide (15 groups to determine which pollutant has the largest effect on daphnia heart rate. It was hypothesized that pesticide would have the largest effect. Using a microscope and stopwatch, the heart rate of the daphnia was observed. A pollutant was added and the heart rate measured. Three trials were completed. Every pollutant increased the heart rate with herbicide most significant. This research could benefit the agriculture industry, chemical firms, and medical field to understand more about how toxins affect the ecosystem.

Project Number: MES016

Grade: 7

Title: Mucky Ducky

Abstract: 10 mL of gasoline, liquid Tide laundry detergent, Scotts Liquid Turf Builder grass fertilizer, Acid rain, motor oil, and Round-Up plant killer were added to 2 L of purchased spring water. Thirty Lemna minor were placed in each of the seven containers or pollutants used in this investigation. The length of the fronds, as well as the length will be measured and averaged for 8 weeks.

Project Number: MES017

Grade: 8

Title: Watch Out for Radiation

Abstract: The purpose of my experiment is to determine if different types of glass over a solar still would help create a significant amount of evaporation. I was curious about how different types of glass improve energy efficiency in people's houses. I used a bowl with water inside and placed an empty cup inside the bowl of water. I then covered it with plastic wrap and made an air tight seal. After four hours in the sun I took my observations. The regular solar still produced more water than the solar still with the Low E glass on top. As I did my research I learned that the Low E glass blocks more of the solar radiation. This caused the still to not heat up and cause evaporation.

Project Number: MES018

Grade: 8

Title: Global Warming

Abstract: Please visit student's exhibit for the abstract.

Project Number: MES019

Grade: 7

Title: Effect of Precipitation on Streams

Abstract: My investigation explored how the pH of precipitation affected the pH of streams. I used a pH test kit to analyze the pH of Haymaker run in Murrysville, the creek behind my house in Penn Hills, and precipitation over a period of forty days. A 10 mL sample was used for all tests. After our area started getting frequent precipitation, the creek behind my house showed a greater variance in pH than Haymaker Run. My results, however, indicate that individual precipitation events did not lower the pH of those streams as I had hypothesized it would.

Project Number: MES020

Grade: 8

Title: Water vs. Wood

Abstract: The purpose of the experiment is to see if Western White pine, the most popular building material, would be usable in a wet climate. First, soak a certain size board in water for different amount of times. Test the board by adding sand to a bucket, which is hanging from the board, until the board breaks. The average, in kilograms, for the control was, 23.2, for 10 min., 22.9, for 30 min., 22.9, for 1 h., 21.6, for 3 h., 19.5, for 24 h., 18.8. The data shows that, as the length of time that the boards are soaked increases, the strength of the boards decreases.

Project Number: MES021

Grade: 8

Title: Acid Rain and its effect on Deep Creek Lake and its water sources

Abstract: My project is to see if Deep Creek Lake and its water sources are affected by acid rain. I'll do this by measuring the pH of multiple sources with a pH measuring kit from LaMotte science company. I gathered some water from each source and put special liquid into it. Next, I measured the pH of the water and recorded the data. My data shows that acid rain did not affect Deep Creek Lake and its water sources, that is not what I first believed. The normal pH for pure water is 7.0, but DCL is in between 6 -7.

Project Number: MES022

Grade: 8

Title: The Effect of Water Temperature on the Respiration Rate of Goldfish

Abstract: Global warming is the gradual increase in temperature at the earth's near surface and oceans over time. As water temperature elevates, the amount of dissolved oxygen in the water decreases, thus increasing stress on aquatic life. As a result, cold water fish are suffering loss of habitat and some species are facing extinction. Evaluating goldfish respiration rates showed that a small increase in temperature can elevate the respiration rate. This finding was also supported when dissolved oxygen in the water was tested and proved that oxygen decreased as temperature increased.

Project Number: MES023

Grade: 7

Title: How does auto pollution affect the growth of plants?

Abstract: Pollution is one of the world's largest problems today. Cars are the biggest source of pollution. In my experiment, I exposed three cloned plants to different amounts of automotive pollution. I gave one plant a daily 5 second dose of exhaust and another plant a weekly dose. The third plant was the control. My experiment showed that pollution can adversely affect the growth of a plant. Both plants that were exposed to pollution grew more slowly and even wilted in comparison to the control. However, I tested the acidity of the harmed plant's soil and the soil was not damaged.

Project Number: MES024

Grade: 7

Title: SAVE THE HEAT!

Abstract: Because the sun's energy is so readily available, I am trying to capture it by absorbing it during the day as heat, and dispersing it at night. I will be comparing the solar heat retention of a brick wall, a water wall and a control representing a typical sheet rocked wall. I will make three insulated compartments which I will mount on a south

facing window. I will be recording the temperature of each compartment as well as the indoor and outdoor temperatures every hour. I predict the brick wall will retain the most heat as it is the densest material.

Project Number: MES025

Grade: 7

Title: Growing Plants in Diff. soils:

Abstract: The purpose of my project was to find out what soil helps plants grow the best. I planted parsley plants in different soils with different things in them that people say helps plants grow. The plant that was growing in the soil with the worms in it grew the best. the second best was the plant that grew in the soil with nothing added to it. The plant that grew the in the soil with the fertilizer grew the worst. It turned out that my hypothesis was correct, the plant that grew in the soil with the worms grew best. The plant that grew in the soil with the fertilizer grew the worst.

Project Number: MES026

Grade: 8

Title: Radioactive Countertops

Abstract: The purpose of this investigation is to determine which material has the most radon; Granite, Marble, or synthetic. Radon test kits were used to test the amount of radon in each sample of granite, marble and synthetic. Crushed samples of the granite, marble and synthetic were placed into three (one for each sample) air tight containers along with a radon test kit. After 72 hours, the test kits were collected and sent to a lab to be tested for radon. This was repeated three times for each sample. The test results showed that granite had the highest level of radon.

Project Number: MES027

Grade: 8

Title: Water Source and Pollution

Abstract: Please visit student's exhibit for the abstract.

Project Number: MES028

Grade: 8

Title: Bring On the Rain

Abstract: My experiment is called "Bring On the Rain." The purpose of it is to prove the relationship between barometric pressure and precipitation. The procedure was to measure the amount of precipitation and air pressure in five different areas and see how they correspond with one another. At the end of my experiment, I had an average amount of precipitation of .74 and an average change in air pressure of .17. After all my experimentation, I concluded with the fact that my experiment was mainly supported by my hypothesis because of how the air pressure and precipitation varied in each area.

Project Number: MES029

Grade: 7

Title: Acid Rain-A Nature Pain

Abstract: I wanted to see how acid rain effects aquatic plants. I will get acidic related liquids, noting their pH and put an aquatic plant in one. Next, every hour I will make observations and photograph the plant to note changes. I will do this three times a week, for two weeks. I will conduct three trials of this experiment.

Project Number: MES030

Grade: 7

Title: Is Your Trash Biodegradable?

Abstract: The purpose of this experiment is to discover what materials are biodegradable. To conduct this experiment you need six 2 liter bottles, metal, paper, plastic, Styrofoam, vegetables, wood, soil, and rain water. The results were measured once a week for three weeks. The results are that the paper and wood were degrading, some vegetables degraded, and the metal, plastic, and Styrofoam did not degrade. The results indicate that the hypothesis should be accepted and rejected. I accept it because the wood and vegetables degraded and the metal, plastic, and Styrofoam did not. I reject it because the paper degraded.

Project Number: MES031

Grade: 7

Title: Worm's Effect on NPK in Soil

Abstract: Worm's casts release NPK, which enriches the soil and greatly benefits farmers. This experiment was conducted to find out which type of worm, the earthworm or red worm, increased NPK levels the most. Soil containing no worms was tested first as a control. Eight Rubbermaid boxes were filled with equal amounts of soil and 46 earthworms were put in each of the 4 boxes, and 46 red worms were put in each of the remaining 4 boxes. The soil was tested with soil testing kit to find levels of NPK in the soil. It was found that earthworms raised NPK levels the most.

Project Number: MES032 **Grade:** 7
Title: Acid Rain
Abstract: Please visit student's exhibit for the abstract.

Project Number: MES033 **Grade:** 7
Title: Which bag decomposes faster - paper or plastic?
Abstract: Please visit student's exhibit for the abstract.

Project Number: MES034 **Grade:** 8
Title: Plants + NaCl = Death
Abstract: The experiment conducted was used to symbolize what effects NaCl has on the environment. The procedure was: for plant "A", no salt, plant "B" ¼ tsp. salt, Plant "C" ½ tsp. salt, Plant "D" ¾ tsp. salt, and Plant "E" with one tsp. salt. The salt content was dissolved into 1/8 cup water for the four tested with salt. The results show that with the higher salt content the worse the health of the plant. As a result, one may conclude that the presence of salt is detrimental to plant growth.

Project Number: MES035 **Grade:** 7
Title: pH Levels from different Sources
Abstract: The purpose of this experiment is to demonstrate the variation of the pH of water from various sources. The pH scale measures how acidic or basic a substance is. Water samples were collected from six different sources. Using an electronic pH tester, all samples were tested for pH at two different temperatures. The range varied from acidic to basic. The temperature range used in this experiment did not affect the pH of the sample. A possible research application would be a study of pH stability at progressively extreme temperatures.

Project Number: MES036 **Grade:** 8
Title: Absorption of Pollutants in Diff. Soil Types
Abstract: The purpose of this experiment was to see which combination of different types of soil and pollutant is most absorptive. There are three basic types of gardening soils. They are clayey soil, loamy soil, and sandy soil. Different pollutants were poured into the soils, and an equation was used to figure out how much of the harmful substance was absorbed. This experiment can be applied in studies of horticulture and botany.

Project Number: MES037 **Grade:** 8
Title: Clean Water is Better Than Dirty Water
Abstract: My purpose for doing this experiment is to find a new way to eliminate chlorine in water. Activated Carbon can eliminate chlorine. My procedure is I poured cold, cold, medium, and warm water into a PVC pipe with Reactivated Carbon in into a PVC Pipe with Reactivated Carbon in it and another with Activated carbon in it. My goal is that both would eliminate chlorine in water. My results are that both medias eliminate all of the chlorine. Spent Carbon can be recycled to eliminate chlorine. In conclusion, Spent Carbon can be recycled into Reactivated Carbon, and still eliminate chlorine.

Project Number: MES038 **Grade:** 7
Title: Sandbag Simulation
Abstract: Please visit student's exhibit for the abstract.

Intermediate Engineering / Robotics

Project Number: MER001 **Grade:** 7
Title: Electric Car
Abstract: The purpose of my experiment was to see if I can make my car go up 60 degree angle. The procedure was I built the car and a ramp.I programmed my car to up the 60 degree ramp. Then I set the ramp at different degree angles and saw what the highest angle the car could climb was. The highest angle that the car could climb was 60 degrees.In conclusion,my hypothesis was correct that i can make my car go up a 60 degree ramp.

Project Number: MER002 **Grade:** 7
Title: Fuel Efficient Tires
Abstract: Purpose: To find out if nitrogen really helps save on gas mileage and why people recommend it.

Procedures: Filling two tires with nitrogen and two tires with Air. All four were filled to 7.5 kilopascals and checking the tire pressure after my dad had stopped for gas. This ranged around every seven days.

Data: I got 6.6 for front air, 6.6 for rear air, 6.6 for front nitrogen, and 7.1 for rear nitrogen.

Conclusion: Nitrogen prevents erosion on chrome wheels, and it isn't flammable. Air is a source for fire and is free.

Project Number: MER003

Grade: 7

Title: Can a Robotic Tank follow a line?

Abstract: My project was to build a robotic tank that could follow a line. I made it do this by doing the technology design process and by programming it. I used the program 2.5.4 Mindstorms programming. I built 2 robots so I could see if my results were good on both robots. Also i used a attachment called a light sensor that helps the robot by deteching the line to follow it.

Project Number: MER004

Grade: 8

Title: Cheap Energy

Abstract: The purpose of this experiment was to produce a wind powered/mechanically powered generator. An electromagnet generator was created to turn motion force into electrical force. The electricity produced was used to light a small LED bulb. This experiment can be applied in studies of energy and engineering.

Project Number: MER005

Grade: 7

Title: Wind Turbine

Abstract: The purpose of the experiment was to determine if the length of a wind turbine's blades affects the amount of electrical output running from the wind turbine. The procedure was attaching the PVC pipe to the base. Then attaching the generator to the PVC pipe. Finally, attaching the blades to the generator wheel. The results the project were that the 15.25 cm blades produced a average of 297.7 voltages. The 25.4 cm blades produced 133 voltages. In conclusion, the smaller sized blades produced more electrical output.

Project Number: MER006

Grade: 8

Title: Standing on Solid Ground

Abstract: Site investigations are necessary in order to determine if an engineering project will take place. The weight bearing capacity of soil is an important aspect in this analysis for construction projects. This investigation is intended to determine which soil type will bear the most weight. Five soil types were tested dry and saturated for depth of compression. A soil bearing capacity apparatus was constructed with a weighted dowel that measured this compression. Three trials for each soil were conducted. It was concluded that dry clay soil had the best weight bearing capacity, exhibiting the least amount of compression.

Project Number: MER007

Grade: 8

Title: How To Cool With Electronics

Abstract: My project is about how a thermoelectric cooler can be used to cool or heat an object. First, I apply voltage to the thermoelectric cooler to get one side cooler than the other side. Next, I made one side of the thermoelectric cooler cold and one side and measured the voltage it produced. The data received was temperatures of both sides based on how much voltage I gave and how much voltage is given based on the temperature difference of each side of the thermoelectric cooler. For future work, I would like to test out different thermoelectric coolers.

Project Number: MER009

Grade: 8

Title: Bridge Strength

Abstract: Bridges are a common everyday sight. This experiment is to determine which bridge design (arch, truss, and cantilever) will support the most weight. I believe that the arch bridge will support the most weight, and that the truss bridge, in contrast, will support the least. Three different bridge designs were built, using a pen knife, thin wood strips and gorilla glue. After that, I then tested by hooking a bucket of water underneath the bridges. Then I will weigh the bucket and record the weight. Based on my findings, I will conclude which bridge design is the most supportive.

Project Number: MER010

Grade: 8

Title: Hovercraft

Abstract: The purpose of this experiment was to see how increasing air exhaust decreases the maximum weight capacity of a hovercraft. The other objective was to see how the area of a circular exhaust hole relates to air loss? A hovercraft was built using common household items such as plywood, plastic, and a leaf blower. The designed hovercraft on setting one could carry approximately 130 pounds a distance of 10 meters. The physics of this experiment could be applied to uses in transportation and engineering.

Project Number: MER011 **Grade:** 8
Title: Baghdad Battery
Abstract: In the 1930's, an archaeological expedition discovered a 2,000 year old pot with a liquid and metals that was deemed the "Baghdad Battery." The purpose of this experiment was to reconstruct this ancient battery prototype and test for electricity. After construction, 0.5 volts were measured. This experiment showed how the use of vinegar and metals can produce an electric current.

Project Number: MER012 **Grade:** 8
Title: Harmonograph
Abstract: The purpose of this experiment was to create a working harmonograph and measure patterns created by sound energy. Random noise was compared to harmonic music and measured. The harmonograph showed that pleasant sounds such as music produce a more regular pattern than random noise.

Project Number: MER013 **Grade:** 7
Title: What about walking robots
Abstract: The purpose of my experiment was to determine if I could make a walking robot. I hypothesize that I can make a robot that could walk on four legs and it would be able to walk for 20 seconds. To make the robot to walk I will have to put all of the gears in place and line up the axles so that the robot can walk without jamming and not stopping.

Project Number: MER014 **Grade:** 7
Title: Additives Effect on Jello Strength
Abstract: Please visit student's exhibit for the abstract.

Project Number: MER016 **Grade:** 8
Title: Pulling Homeruns Out of Thin Air
Abstract: The purpose of this experiment was to see how elevation affects the distance a baseball will soar. A paintball gun was used to simulate a baseball soaring at different elevations. This set-up was tested at numerous ball parks around the Pittsburgh area. At higher elevations the paintballs traveled a farther distance because as elevation increases the gravitational pull on air molecules decreases, causing the ball to move faster. Consumer scientists and engineers would be interested in this experiment.

Project Number: MER017 **Grade:** 7
Title: Blade shape and energy
Abstract: Please visit student's exhibit for the abstract.

Project Number: MER018 **Grade:** 7
Title: Solar - Tracker
Abstract: Please visit student's exhibit for the abstract.

Project Number: MER019 **Grade:** 8
Title: Bridge Designs
Abstract: Please visit student's exhibit for the abstract.

Project Number: MER020 **Grade:** 8
Title: Guitar Tuning
Abstract: The purpose of this experiment was to see how a change in temperature affects a guitar's tuning. Increasing the temperature caused the materials of the guitar and strings to expand, putting more tension on the strings and causing the pitch to become higher. Decreasing the temperature causes the materials to contract, and released tension on the strings, making the pitch lower. Musicians and engineers would be interested in this experiment.

Project Number: MER021 **Grade:** 7
Title: Automatic Bird Feeder Refiller

Abstract: The purpose of this project is to find an easier way to fill a bird feeder. I am planning to do this by using an auger and a motor to move the feed from the bucket, up a PVC pipe and deposit it in the feeder. There will be a switch in the house to turn it "on" or "off".

Project Number: MER022

Grade: 8

Title: Heated Light Bulbs

Abstract: The purpose of this experiment was to see which light bulb gives off the most heat, and therefore, is the most energy inefficient. Different light bulbs were tested in a controlled setting. The Fluorescent 13 watt light bulb was the most energy efficient because it gave off the least amount of heat and emitted light of a 40 watt light bulb. This experiment can be applied in studies of energy and engineering.

Project Number: MER023

Grade: 8

Title: Bridge Design vs. Bearing Capacity

Abstract: the purpose of this investigation is to determine which bridge design has the greatest weight bearing capacity. In this investigation, bridge models were made out of popsicle sticks (3 of each: truss, arch and plank). The bridges were tested between two supports with evenly distributed mass on the bridge until the bridge collapsed. The truss design bore the most mass because its triangular design supported the mass the best. The pressure was evenly distributed instead of all at the center.

Project Number: MER024

Grade: 8

Title: Solar Power - Solar Bot

Abstract: The purpose of this experiment was to see how solar power can be made for indoor home use safely and inexpensively. A simple and safe solar powered electrical circuit was designed to operate a single 75 watt DC light for a six-hour period. The constructed solar powered light and the grid powered light were operated for six hours per day for seven days. The light output in brightness throughout this period was compared, and total energy costs in Kilowatts per hour were calculated. This experiment can be applied in studies of energy and engineering.

Intermediate Medicine / Health / Microbiology

Project Number: MMH001

Grade: 8

Title: Streptococcus bacteria and Vitamins A, B12, C and D

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH002

Grade: 8

Title: Difference Between Regular and Antibacterial Soap

Abstract: The purpose of my experiment was to find if regular liquid soap and antibacterial soap were different when inhibiting bacteria. I hypothesized antibacterial soaps would inhibit the most bacteria. I gathered materials which included regular and antibacterial Dial soap, and regular and antibacterial Soft Soap. I then conducted my tests by putting either e coli or staphylococcus bacterial on the agar plates and then putting the soap in small holes. I waited 48 hours for the bacteria to grow and measured the zone of inhibition. In conclusion, the antibacterial soap inhibited the most bacteria.

Project Number: MMH003

Grade: 7

Title: Spoiled

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH004

Grade: 7

Title: Growth Conditions of Mold

Abstract: In this project, I will determine which kinds of food mold grows best on and in which environment. I want to know if mold growth prefers: light or dark environment, warm/humid environment, or cold environment. Does the texture of the food make a difference? I will choose 3 foods. Enclose them in air tight plastic bags. Place them in different environments for two weeks. Make observations and conclusions.

Project Number: MMH005

Grade: 8

Title: How Contam. is Wtr Spry on Prodc?

Abstract: The purpose of this experiment is to determine if water sprays used in grocery stores' fresh vegetable sections is spraying bacteria on the produce. At selected grocery stores, 10 ml samples were gathered from their sprayer station in sterile test tubes. Each sample was tested for various coliforms, specially e-coli (there are 6 genus and 12 species), and general (total count) bacteria. Pre-measured media and prepared Petri dishes were used for the two tests. After inoculation and incubation, colonies of bacteria were recorded and analyzed. The results proved bacteria are present in the water sprays.

Project Number: MMH006 **Grade:** 8

Title: Home Remedies vs Medicine

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH007 **Grade:** 8

Title: Sugar You Move Me

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH008 **Grade:** 8

Title: Do You Want to Drink That?

Abstract: The purpose of this experiment is to show Americans the adverse affects of not brushing their teeth before going to bed. The procedure that was used was to add 300ml of each beverage to each labeled jar. Every three days the eggs were removed and the mass was calculated. Every six days the liquid samples were removed and replaced with fresh liquids. All of the egg samples without a neutral ph (7) gained weight for 6 days and then constantly lost mass. After recording the mass loss and physical observation monster energy is the worst tested beverage on egg shell deterioration.

Project Number: MMH009 **Grade:** 7

Title: Can you cook food without heat?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH010 **Grade:** 7

Title: What Vits Inhibit Bacteria?

Abstract: The purpose of this experiment was to find out what vitamin inhibits bacteria the best. Vitamin A, D, E and C were used. The hypothesis was that Vitamin C would inhibit the best. For this experiment, E coli and Staphylococcus Epidermidis were swabbed onto agar plates and the vitamins were placed into wells. Zone of Inhibition was measured on day one and day two. Vitamin C was the only vitamin to inhibit bacterial growth. E coli was inhibited more than Stapylococcus Epidermidis. This data suggests that Vitamin C inhibits bacteria the best.

Project Number: MMH011 **Grade:** 8

Title: Feel the Burn, Heal the Burn

Abstract: The stomach produces hydrochloric acids, and too much of this acid can result in heartburn. The purpose of my experiment is to observe which antacid neutralizes gastric (hydrochloric) acid the best and whether it is better to use antacids or proceed onto a low-acid diet. Four different antacids and a low-acid meal were used in my experiment. Results state a low-acid diet is helpful, but not everyone watches this carefully. One antacid raised the hydrochloric acid's pH the most. This experimentation can benefit many pharmacists to produce improved, helpful, and OTC medicines by knowing the difference and the ingredients.

Project Number: MMH012 **Grade:** 7

Title: Medicine Meltdown the Fastest Pain Relief on the Shelf

Abstract: My science project question is: what over-the counter pain medicines that come in different forms dissolve fastest? I developed a scientific method that would test in experiements the dissolving rate of different pain relievers. Subsequently, I formed a hypothesis where I expected pain medicine in gel cap form to dissolve quicker than other forms. My hypothesis also predicted that aspirin would dissolve slowest. When my experients were completed and results examined, the first part of my hypothesis was confirmed, but the last part was not. My research helped me learn about how medications work.

Project Number: MMH013 **Grade:** 8

Title: Tough on Your Teeth

Abstract: The purpose of this experiment was to see the effect of different everyday beverages on tooth enamel. The problem was what type of beverage will cause the most loss of tooth enamel. Several beverages were tested on

real teeth, and the percentage of tooth enamel lost was calculated. Dentists and beverage consumers would be interested in this experiment.

Project Number: MMH014

Grade: 8

Title: Lung Capacity: Boys vs. Girls

Abstract: My project involved 5 boys and 5 girls from both 8th and 6th grade, a total of 20 people. The purpose of my project was to find if boys or girls have a better lung capacity. First, I used a ruler to draw a line around the circumference of 20 unblown balloons. When I gathered my subjects I had each of them take 3 deep breaths and stretch the balloon 3 times. Then I had my subjects blow up 3 balloons each with a 1 minute interval between each balloon. My results concluded that boys have a better lung capacity.

Project Number: MMH015

Grade: 7

Title: Water the Chances

Abstract: In my project I wanted to know which type of water purification method works best in removing harmful bacteria from water. My methods were an ultra violet purifier, a commercial grade paper filter, and boiling water. My hypothesis was that the ultra violet purifier would purify the water the best. I came to this hypothesis because in my research I discovered that UV will kill all bacteria on contact because UV disrupts the replication of DNA in the bacteria rendering it inert. During my project I gathered a large source of water and took small samples. After I took the samples I ran the samples once through each objective. I took an eye dropper and placed three drops of water onto the Petri dishes. I placed the Petri dishes inside the incubator and recorded the results after 24 hours. I did this process for three trials.

Project Number: MMH016

Grade: 8

Title: What's In Your Mouth?

Abstract: Bacteria in your mouth can cause many health problems. My experiment was designed to see if mouthwash would kill the bacteria. The subjects swabbed their mouths before and after using mouthwash. I then plated them on an agar plate and placed the plates in an incubator. I counted the bacteria before and after the use of mouthwash. I did two trials of testing with the same subjects one week apart. The results varied in the two trials and I could not confirm my hypothesis that the mouthwash would kill the bacteria.

Project Number: MMH017

Grade: 8

Title: Can You Keep Bacteria from Passing Through Fabric?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MMH018

Grade: 8

Title: Bacteria on Sponges

Abstract: The purpose of this experiment is to find out which method of cleaning sponges removes the highest percentage of bacteria. After soiling nine sponges by cleaning a table, a sink, and mopping up ketchup, I will take a sample from each sponge and let the bacteria grow for one week. I will then clean three sponges by microwaving them, three by putting them in the dishwasher, and three by soaking them in water with bleach. I will let each clean sponge's bacteria cultures grow for one week. I will compare the dirty sponge bacteria count to the clean sponge count.

Project Number: MMH019

Grade: 8

Title: Does It Really Work?

Abstract: I wanted to know if hand sanitizer or anti-bacterial soap worked better at removing germs from your hands. I will get volunteers. Have the volunteer wash and dry their hands according to CDC Guidelines. Have the volunteer play with pennies for one minute. Have the volunteer apply hand sanitizer to their hands according to label directions. Swab their hand and apply to nutrient agar plate. Repeat process using anti-bacterial soap. Complete ten trials of this process. (Use new group of pennies with each)

Project Number: MMH020

Grade: 8

Title: Does GermX really kill the most germs?

Abstract: The purpose of this experiment will be to determine if GermX hand sanitizer is better at cleaning your hands than soap or water alone. For my experiment I plan on swabbing hands of people before and after they use Germ-X, soap and water, and water alone.

Project Number: MMH021

Grade: 7

Title: Rub A Dub Dub

Abstract: After sterilizing my work space nutrient agar plates were divided into four quadrants and streaked with Staphylococcus epidermidis. 1 mL of aro green soap was mixed with 250 mL of tap water. Paper discs were soaked in the solution before being removed, allowed to drip and placed in each quadrant. After 48 hours the zone of inhibition was measured. A template was drawn on the hands of participants 250 mL of water was poured on the hands and 1 mL of hand soap was applied. This was repeated for 5, 10, 15, 20, and 120 minute time intervals. Percent reduction was calculated.

Project Number: MMH022

Grade: 7

Title: Factors of Bacteria in the Air

Abstract: The purpose of my project is to see what factors affect the amount of bacteria in the air. I will place Petri plates with nutrient agar in different rooms of the same size to see which rooms have the most bacteria. I will compare the results to see if there is a correlation between the number of people that occupy a room and the amount of bacteria found in the air. I have not yet completed this investigation so I can't report on the results.

Project Number: MMH023

Grade: 8

Title: Antibiotic Bacteria Resistance

Abstract: Purpose of experiment was to compare four antibiotics, penicillin, ampicillin, gentamicin, streptomycin to bacteria, bacillus cereus. Tested antibiotic to see if bacteria formed resistance to antibiotic over seven, ten, thirteen, sixteen days. Procedure: laying materials, placing three antibiotic disks, one control disk on Petri dish after swiping bacteria. Do 32 Petri dishes, observe every day, measure distance between bacteria, antibiotic, average three disks, each dish. Data: average data measuring effectiveness: Streptomycin-1cm., Gentamicin-.5cm., Penicillin-.01cm., Ampicillin-.03cm. Conclusion: close hypothesis. Streptomycin killed bacteria, Gentamicin effective, Ampicillin hardly effective, Penicillin barely. At end of study, saw antibiotic resistance on Streptomycin, Gentamicin plates, proved hypothesis.

Project Number: MMH024

Grade: 8

Title: Is reusing water bottles safe?

Abstract: The purpose of this investigation was to see if reusing water bottles without washing them is safe. Water bottles were tested several times after different intervals of use. Bacteria was grown using nutrient agar and an incubator. Bacteria counts were compared.

Project Number: MMH025

Grade: 8

Title: Spices and Antibiotics

Abstract: Some spices are known to have an antibacterial effect. My science fair project consists of testing whether the addition of spice to antibiotics affects bacteria sensitivity to the antibiotic. In my experiment, I will test four different bacteria, Staphylococcus Aureus, Escherichia coli (E. coli), Streptococcus, and Klebsiella pneumonia. I will use black pepper, garlic powder, and cinnamon as the spices in my experiment. By measuring the clear zone around the antibiotic disk and the spice, I will be able to determine whether or not spice modifies the effectiveness of the antibiotics.

Project Number: MMH026

Grade: 8

Title: The Effectiveness of Hand Sanitizers on Bacteria

Abstract: Hand sanitizers are supplements or an alternative to washing hands with soap and water. This experiment was intended to find out which hand sanitizer works the best. Paper discs soaked with eight hand sanitizers, three ingredients and sterile water and were placed on agar plates streaked with Escherichia coli, Micrococcus luteus, and Staphylococcus epidermidis. Three trials were conducted for each. The 72 agar plates were placed in the incubator for 48 hours at 37.5° Celsius. Plates were removed, and zones of inhibition were measured, and the results of the three trials were averaged. It was determined the Walgreens Foaming best inhibited the growth of the bacteria. The data also showed that Walgreens was the only product to contain the active ingredient Benzalkonium chloride. Future work is planned to test more strains of bacteria.

Project Number: MMH027

Grade: 8

Title: Are Sach. Cervise & Aspergillus Niger as Effective in inhibiting Bacteria

Abstract: The purpose of this experiment was to find a fungus to inhibit bacterial growth. The experiment involved spreading bacteria onto an agar plate. Next fungus was placed into 4 holes in the agar plate. The plates were placed into an incubator and the zone of inhibition was measured. In trial one, Penicillin had a 4 mm average zone of inhibition and trial 2 an average of 5mm. No zone of inhibition was identified with the other fungus. In conclusion, penicillin was most effective in inhibiting bacteria. No other fungus had an affect on the bacterial growth.

Project Number: MMH028

Grade: 8

Title: Flooring Effect on Bone Stress

Abstract: This demonstrates to society which surface is better for physical activities. I built a platform from wood, hardware, and a tennis racket frame. I did my experiment by placing the flooring in the frame, put an egg in a ballet shoe on the wooden arm, and drew the arm back. The shoe sprang forward into the flooring cracking the egg, demonstrating bone stress. I measured the length of cracking. Ten trials were conducted for each type of flooring. Carpeting was best with the 7.11 cms, then vinyl tile (8.66), laminate hardwood (9.15), concrete (10.3), lastly hardwood 12.46 cms. Carpeting causes the least amount of bone stress and hardwood flooring causes the most.

Project Number: MMH029

Grade: 8

Title: Don't Eat That!

Abstract: Does the five second rule really work? To do this project, while wearing sterilized gloves, I will drop a piece of bologna on the bathroom floor, leave it there for five seconds, pick it up and swab the part that hit the bathroom floor. Place the swab on nutrient agar. Place the agar plates in the recommended growth area. Make observations and comparisons. I will do at least ten trials.

Project Number: MMH030

Grade: 8

Title: Are pasteurized eggs all they're cracked up to be?

Abstract: Sterile 5 X 5 cm gauze was moistened, pressed on the eggs so that all corners were touching, then imprinted onto an agar plate. To test the yolk, the egg was cracked into a sterile Petri dish, purposely not excluding shell fragments. Plates were incubated for 48 hours at 36 degrees C. All bacteria on the plates were gram stained, and all gram negative bacteria were tested for salmonella. This procedure was repeated again each week with one dozen eggs of Giant Eagle Regular eggs, Giant Eagle Organic eggs, and Davidson's Pasteurized egg.

Project Number: MMH031

Grade: 8

Title: Which Mouthwash Is Best?

Abstract: People want fresh breath and healthy mouths. This experiment was designed to determine which mouthwash kills oral bacteria the best. Eleven different mouthwashes and sterile water as a control were tested, 2 trials for each. Twenty-four agar plates were streaked with *Lactobacillus acidophilus* or *Streptococcus salivarius*, then each plate was inoculated with a type of mouthwash or sterile water. The plates were incubated at 39 degrees Celsius for 48 hours. The zones of inhibition were measured on each plate, and data were averaged for each trial. The experimenter's hypothesis was incorrect; Listerine did not perform the best. Act was the best mouthwash due to the active ingredient CPC. If this experiment were repeated, more mouthwashes and bacteria would be tested and bacteria would be allowed to incubate for a longer period of time.

Project Number: MMH032

Grade: 7

Title: Natural Antibiotics VS Synthetic Antibiotics

Abstract: The problem in this investigation is "Which antibiotic, synthetic or natural, will prove best on controlling the growth of the *Escherichia Coli* and *Lactobacillus acidophilus*?" It was my hypothesis that this investigation would yield the following results. Natural Antibiotics will inhibit the growth of bacteria more than the Synthetic Antibiotics

Project Number: MMH033

Grade: 8

Title: Wasting Water Bottles

Abstract: The purpose of this experiment was to see if it is safe to reuse water bottles over and over again. A water testing kit was used to test three different brand name water bottles that were refilled over a period of fourteen days. Results showed that it is not safe to reuse water bottles over an extended period of time. Microbiologists and everyday consumers would be interested in the studies of this experiment.

Project Number: MMH034

Grade: 8

Title: Bathroom Bandit

Abstract: To find which bathroom cleaning substance kills the most bacteria in a bathtub. I will spray one part of the bathtub with a substance. Scrub the part for time recommended on manufacturers instructions. Rinse. Air dry for one hour. Swab the area and place swab on nutrient agar plate. Incubate agar plate according to instructions. Repeat steps for each bathroom cleaner. Monitor bacteria count and compare results.

Project Number: MMH035

Grade: 7

Title: Should You Answer That?

Abstract: Should you answer that? I did this project to see if our telephones are cleaner than our toilets. We use each daily, but don't hesitate to constantly touch the phone. I used toilets and telephones in my home. Sterile cotton swabs were used to swab each item and then transferred to a petri dish in zigzag motion. My hypothesis was that the telephones contain more bacteria. I was correct in this assessment. Telephones are dirtier. I learned that our telephones should be cleaned more often. We clean our bathrooms on a weekly basis; why not clean the telephones as often.

Project Number: MMH036

Grade: 8

Title: Food Preservatives on Microorganisms

Abstract: How does a food preservative affect microorganisms? Salt was tested to gauge its effectiveness on preserving. To test this, meat was placed in jars and then filled with water. Different amounts of salt were placed in each jar to test which amount was most effective. The meat was left to sit three days in the salted water. Samples were taken on the third day from the water in each jar and placed on Petrifilms for observation. Bacterial growth was observed from Petrifilms to determine how salt, as a preservative, inhibited microorganism growth and at which amounts it was most effective.

Physics - Intermediate

Project Number: MPH001

Grade: 7

Title: Batter Up!

Abstract: In my project "Batter Up!" I used three different substances, placed into the same shape and size of hollowed out wooden baseball bats. I tested rubber, sawdust, cork fill, and one solid wooden bat. In my experiment I wanted to see which substance in the bats would make a baseball go the farthest. During this baseball season, I hit for .675 and I wanted to know how I can get that average up. You have to follow a certain procedure to get this right. First you have to build a batting device so that it will swing the bat the same speed everytime. Then, you attach the bats to the batting tee. Last, you pull the device back and release. Record your data after you measure the distance. My results showed my hypothesis correct.

Project Number: MPH002

Grade: 7

Title: Storage Temperature and Rebound

Abstract: Storage temperature and rebound was created to find out if lacrosse balls made completely of rubber, bounced higher when hot, cold, frozen, and left at room temperature. To test this five lacrosse balls were put in an oven, five others were put in a freezer, another five were put in a refrigerator, and the last five were left at room temperature. The results showed that the balls in the oven bounced the highest, then the room temperature, followed by the refrigerated balls, and last, the balls in the freezer as hypothesized.

Project Number: MPH003

Grade: 8

Title: Insulation Nation

Abstract: With a floundering economy and a global environmentalist effort, America needs to use Earth's natural resources wisely. This experiment was conducted to test if environmentally friendly internal housing insulation materials are as effective at retaining heat as traditional insulation materials. To conduct this experiment, the insulation materials were filled in the gap between a test box and a larger box. The inner box was heated for ten seconds, and the temperature was recorded at five minute intervals for twenty-five minutes. On average, the traditional fiberglass reached the highest temperature in the beginning, while the "green" insulations retained heat the best.

Project Number: MPH004

Grade: 7

Title: Effectiveness of Insulation

Abstract: Which type of insulation (flannel, cotton, feathers, human hair, and attic insulation) would retain the most heat over a 2-hour period? To test this, I lined 500 ml jars with 2 cm thickness of each insulator. I left 1 jar without insulation for the control. I put boiling water in each jar and placed the jars in the refrigerator for a total of 2 hours, checking temperatures every 15 minutes. In conclusion, wool, attic insulation, and cotton had retained the most heat over the 2 hours. All variables had at least ten degree difference from the control.

Project Number: MPH005

Grade: 7

Title: Fabric vs Electricity

Abstract: The problem: Will a change in fabric change the amount of energy passing through.

It is hypothesized that the metallic fabric will conduct energy better than the fabric that has none such as cotton or polyester.

The procedure is as follows. The materials are hooked up to the battery and clips individually. Each square was tested with the same light bulb, light bulb stand, battery, and alligator clips. This experiment was done four times on each of the following: cotton, polyester, cotton-poly mix, metallic polyester, vinyl, felt, and spandex.

The results do not support the hypothesis.

Project Number: MPH006

Grade: 8

Title: The effect of sound waves on different materials

Abstract: Sound absorption is interesting to me due to my brother's hearing loss. I hope to prove what material absorbs sound the best. To test the variables, I built a box. In the one end, I put a speaker and in the other end a decibel meter. I tested frequencies of 60 hz and 100 hz passing through my variables. I found that at 60 hz single pane glass was most effective. At 100 hz, styrofoam was the most effective. My most major finding was that the effectiveness of the independent variables differed significantly at the two different frequencies.

Project Number: MPH007

Grade: 8

Title: Diameter Makes a Difference

Abstract: The purpose of this experiment is to figure out if the diameter of a skateboard wheel can change the speed of a skateboard while in motion. I fastened three different size wheels on a skateboard for three sets of tests. I speed tested each set of wheels for five time trials, recorded data, and averaged out the data for each wheel size. After testing, my hypothesis was correct. The biggest diameter wheel was the fastest.

Project Number: MPH008

Grade: 8

Title: The Inflate Debate

Abstract: My question is: Which gas expands the most? My hypothesis was that they all would expand the same according to Charles' Law. After gathering all my materials, I placed a drainage tube in a bucket. I filled the bucket up with 4.44 degrees celcius of water, plugged it up with a cork, and placed a balloon filled with oxygen in it. After ten minutes, I released the cork and measured how much water drained out. I did this three more times for nitrogen, argon, and carbon dioxide at 21.09 degrees celcius and 37.74 degrees celcius. In conclusion, all the gases averages were all within 1 percent. My hypothesis was close to correct because they all expanded close to the same amount.

Project Number: MPH009

Grade: 7

Title: Does Coil Shape Affect Heat

Abstract: This project looks at how changing the coil shape of electromagnets affects the speed and temperature of each. Three motors were built, each with a different coil shape (circle, square, and triangle). The speed of each motor was observed and temperature readings of each coil were also measured. The square-shaped coil ran the fastest and had the lowest average temperature. Even though the number of coils on all of the motors was the same, the square-shaped coil may have had more surface area of wire in general. This would explain why it ran the fastest and at the coolest temperature.

Project Number: MPH010

Grade: 8

Title: Can Water Float on Water

Abstract: The purpose of this project was to see if water can float on water. During my first procedure I had salt water in one container (dyed blue) and one with fresh water (dyed red) in the other. In my last procedure I had hot water in one container (dyed red) and cold in the other (dyed blue). My first set of data proved that fresh water can float salt water and my second set proved that hot water can float on cold water.

Project Number: MPH011

Grade: 7

Title: The Wooden Bat Experiment

Abstract: The problem is, If you use a different type of wooden baseball bat than others, will that affect how far you can hit a baseball? It is hypothesized that, If different types of wood affect how far you are able to hit a baseball, people using maple bats will hit better than people using oak and pine bats. A brief procedure of the experiment is as follows. One piece of oak, pine, and maple wood was made according to the directions given in the procedure of investigation. The three pieces of wood were tested 15 times each using the same angle of release to hit a baseball off a shelf. The materials were placed in the same spot for each test. When the different woods hit the baseball of the shelf a tape measure was used to measure how far the ball went in inches and data was recorded. This was repeated for the rest of the trials.

Project Number: MPH012

Grade: 7

Title: That's the Way the Wind Blows

Abstract: The purpose of my project was to find out what wind turbine blade shape is the most efficient. To determine this, my Dad and I built a model wind turbine generator using a small DC motor. To measure efficiency, the voltage generated by six different shapes was recorded. We tested the shapes at three different angles, with the wind source at two different angles. The shapes that performed the best were numbers 1 and 5. My conclusion is for a home built wind turbine, the best blade shape is not the usual thin elliptical shape used for utility wind turbines

Project Number: MPH013

Grade: 8

Title: Egg-cellent Eggs-periment

Abstract: An egg has an arched shape which distributes the weight evenly. This experiment will determine the strength of an egg at different orientations to understand the arched shape and how it is applied to bridges and architecture. To conduct the experiment, place four eggs in three orientations, small end down, big end down, and horizontal, apply weight and measure at point eggs break. Record the average weight from trials. Small end down: 12.5874 kg. Big end down: 12.57795 kg. Horizontal: 9.87525 kg. Small end down and Big end down held similar weight. While Horizontal, all orientations were very strong.

Project Number: MPH014

Grade: 8

Title: On Which Spoon Will the Butter Melt the Fastest?

Abstract: My project was "On which Spoon Will the Butter Melt the Fastest?" In this experiment I was seeing which spoon would conduct heat faster. I put butter on the handles of each spoon. Then put the spoons in a bowl of hot water. The spoons I used were a wooden spoon, thin metal, plastic, and thick metal. I timed the butter and how fast it took for it to melt off the spoon. The thin metal came in first, then plastic, thick metal, and last wooden.

Project Number: MPH015

Grade: 8

Title: Conductance & Electrolyte Concentration

Abstract: The human body depends on a proper electrolyte balance. Athletes are especially dependent because they lose electrolytes through sweat. The problem studied in this experiment was which sports drink contains the most electrolytes. To measure electrolyte concentration, an open circuit was made with copper wire, a nine-volt battery, a non-conductive spacer, and a multimeter. In total, thirteen beverages were tested three times each. Results were converted to conductance measured in siemens, which is proportional to the electrolyte concentration. On average, the Powerade (Strawberry Lemonade) and Powerade Zero (Lemon Lime) sports drinks contained the most electrolytes.

Project Number: MPH016

Grade: 7

Title: Green Power Reliability

Abstract: The purpose of the experiment was to see which source of power (wind or solar) is more reliable based on which generated more watts. First, connect the multimeters to both the windmill and solar panel. Next, log the amount of watts being generated at 4:00 P.M. over 13 days. Solar was more reliable than wind because solar generated an average of 0.06338 watts, but wind only generated an average of 0.02954 watts.

Project Number: MPH017

Grade: 8

Title: What is the Best Type of Roof?

Abstract: The purpose of the experiment was to see if a vegetative roof on a bird house maintained the steadiest and most habitable temperature. I put together five bird houses using different types of roofs: foil, white paint, control, asphalt shingle, and vegetation. I gathered data from thermometers that hung in each bird house. The least differential of -.0833 was gathered from the vegetative roof's data. The other differential were as follows: white -.666, foil -1.416, control .4583, and asphalt 2.876. Temperature change data over an eight hour period shows that the average outside temperature changed was 7 degrees Celsius, while the white was 7.22 C, vegetative, 7.77 C, foil 7.88 C, control 8.0 C, and asphalt 8.44 C. Based on the data the hypothesis appears correct given the fact that other benefits increase the advantages to vegetative roofs

Project Number: MPH018

Grade: 7

Title: Light Bulb Types and Temperature

Abstract: The purpose of this investigation is to determine if the type of light bulb affects the temperature it gives off. The procedures are: place light bulb in socket, record temperature, turn light on, and record temperature in fifteen minute intervals. These procedures were used for four light bulbs and five trials. The hypothesis, if different types of light bulbs are turned on and left on for one hour, then the incandescent bulb will be the hottest after one hour, was supported by the data.

Project Number: MPH019

Grade: 8

Title: What Scuba Materials Maintain Temperatures the Best?

Abstract: The ability of various wetsuit materials to maintain constant temperature was evaluated. Wetsuit sleeves were "fitted" with frozen water bottles. The wetsuits were then submerged in a pool, and the temperatures of the water bottles were observed and recorded.

Project Number: MPH020

Grade: 7

Title: Maglev vs. Weather

Abstract: I did my project because countries around the world were planning on building maglevs. I wanted to see if the temperature would affect the speed of a maglev. I ran the maglev in each temperature. Based on my research, I cannot determine whether my hypothesis was proven. The maglev was consistently faster in colder temperatures. In freezing, warm, and hot temperatures the results were unclear. The important facts were that the temperature did not affect the maglev a lot. Orientation did not affect it either. For the future, I could run more tests. Also I could use a steeper slope.

Project Number: MPH021

Grade: 7

Title: Light! Jello! Action!

Abstract: This project was designed to explore the optical characteristics of Jell-O with and without the presence of sugar including refractive index and speed of light through Jell-O. I hypothesized sugar in Jell-O slows down light passing through. I shined a laser through a semicircle of Jell-O at a known angle. From the refracted angle, I was able to calculate the speed of light. Light through Jell-O with sugar traveled slower than that through sugar-free Jell-O. The flavor and color of Jell-O made small differences in the speed of light. The Jell-O scattered light, more so with some flavors than others.

Project Number: MPH022

Grade: 8

Title: Bounce Locations Affecting Bounce Heights

Abstract: My reason for doing this Science Fair Project is to show tennis players where the best place is to hit a tennis ball. All players and coaches can benefit from my results. After constructing a holding table for my racket to be secured to, I dropped a tennis ball from 3.66 m above the ground. I had a second person record the results after the ball was dropped. After experimenting, I concluded the highest average bounce was the top of the racket, then middle, next comes corners, followed by the bottom, and lastly the sides.

Project Number: MPH023

Grade: 8

Title: To Break Or Not To Break

Abstract: A wooden frame was constructed to restrain the materials used in the creation of an embankment dam. Various combinations of rock, sand, and dirt will be used to determine which creates the strongest dam. A 2.5 kg brick suspended from the ceiling will be swung at a 30 degree angle. Indentation as well as the length of debris will be measured to determine which combination of materials created the strongest embankment dam.

Project Number: MPH024

Grade: 8

Title: Roof Color and Temperature!

Abstract: My project is roof color and temperature. I chose to do this project because my uncle has a company that sells shingles and his customers ask him for advice and he doesn't know what to say. If houses are built and placed under a heat lamp then the house with black shingles will absorb the most heat because black absorbs heat. The houses were built then placed under a heat lamp. The temperatures were taken every 15 minutes. My hypothesis was not supported by the data therefore the black roof shingle did not keep the house the warmest.

Project Number: MPH025

Grade: 8

Title: Does color affect windmills?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH026

Grade: 7

Title: Sun Position and Solar Cars Stamina

Abstract: I want to know how the sun's position in the sky affects solar car's performance. If the sun is higher in the sky then the car will have more speed and go faster, so it will affect the car's performance the procedure is simple. First build a car, then go outside and see if the sun's position affects the solar car's performance. I went outside and

did a couple of trails around 10:30 am and came up with the speeds of 2.33, 2.51, and 3.78 seconds. I then did that again and came up with 3.22. I may have more trails.

Project Number: MPH027

Grade: 8

Title: Magic Motor Oil: Which Blend of Motor Oil Gives the Best Lubrication?

Abstract: The purpose of this experiment was to determine and prove whether there is or is not a difference in the actual lubrication different motor oils give. This topic ignited my curiosity. I tested by applying pressure to a lubricated, spinning pulley with a stationary, dry pulley. The more pressure it took to stop the moving pulley, the better the lubrication provided by the given oil. My data showed that racing oil gives the best lubrication followed by full synthetic, synthetic blend, high-mileage, and then conventional. Through these results I hope to benefit consumers by helping them choose the correct oil.

Project Number: MPH028

Grade: 7

Title: Feathers on an Arrow

Abstract: The purpose of the experiment was to determine if the feathers on an arrow affect the accuracy. A target was set up then 10 arrows were shot and the distance away from the bulls-eye was measured. The feathers were removed, then the arrows shot and measured again. The average distance away from the bulls-eye for the arrows with feathers was 10.328 cm and for the arrows without feathers, 46.134 cm. This experiment showed that the feathers on an arrow do give the arrow accuracy.

Project Number: MPH029

Grade: 8

Title: Do Shapes Affect Radar Detection?

Abstract: The purpose of this investigation is to see which shape out of a V-shape, W-shape, cylinder, crushed cylinder, and 11-fold figure would be least visible on radar. To do this I obtained all materials needed, and constructed the test shapes and test box. Then I placed one of the test shapes in the test box, turned on the flashlight and lux meter, recorded the results, and repeated for every shape. The V-shape reflected the least amount of light, or is least visible on radar.

Project Number: MPH030

Grade: 8

Title: Aerodynamic Fuselages

Abstract: The purpose of my project is to find which fuselage shape creates the least drag. I predicted that the cone-ended shape would be best. I built a wind tunnel out of cardboard and used a leaf blower as a source of wind. I then created a proportioned system that measures the force being exerted by the shape. The results were that cone-ended worked best at 0.29 N, then the rounded end at 0.51 N, next the taped at 1.66, and finally the capped at 1.72 Newtons. My conclusion was that the cone-ended worked best at 45 grams or 0.26 Newtons.

Project Number: MPH031

Grade: 8

Title: Which Cloth's Fiber Insulates The Best?

Abstract: My experiment's purpose was to find which fiber insulates the best. I cut a hole into a cooler and hung a thermometer over it. Then I taped a fabric over the hole and placed a candle inside the cooler. Next I recorded the temperature at two, four, and six minutes. I repeated this procedure for each fabric. Lastly I compared the results. The difference between the starting and stopping temperature for wool was six, full-grain leather was two, nylon was eight, polypropylene was seven, and polartec 300 was four. In conclusion full-grain leather insulates the best and nylons the worst.

Project Number: MPH032

Grade: 8

Title: The Refraction of Light Through Jell-O

Abstract: The Refraction of Light is when light changes direction and speed. To determine the refraction of light, a laser is aimed at the wanted medium, and then the angle of refraction is measured in degrees using a protractor. Using a complicated math equation called Snell's Law; it is possible to determine the speed of light through a medium. The experiment was to find the refraction of light through Jell-O. I found that when light enters at a low angle, then the angle of refraction is larger, and when light enters at a high angle, the angle of refraction is smaller.

Project Number: MPH033

Grade: 7

Title: Skateboard Wheels - Large or Small?

Abstract: I like to skateboard and wanted to find out what size wheels are best for speed and maneuverability. I conducted two tests using small and large wheels and two riders of varying weights. For each trial, I calculated the average run time and the number of cones knocked down. My results show that large wheels are better for speed and small wheels are better for maneuverability, but one may have to give up some speed to get maneuverability. In

conclusion, to get the best results in both categories, the ideal wheel size may be somewhere in between small and large wheels.

Project Number: MPH034

Grade: 7

Title: Sweet Success

Abstract: I want to compare which type of cookie sheet material produces the best tasting cookie. I will compare a teflon coated, aluminum, and air bake pan. I will do ten trial of the same cookie dough on each cookie sheet. After observing and grading each cookie batch, I will compare my average results.

Project Number: MPH035

Grade: 8

Title: Parachutes: Does Shape Matter?

Abstract: The purpose of my investigation was to see which parachute shape is the most wind resistant. My hypothesis was that the cricle parachute would be the most wind resistant. I dropped the parachutes from a fixed hieght. I timed them as they dropped. The results of my investigation showed that the cricle parachute is the most wind resistant.

Project Number: MPH036

Grade: 8

Title: Which Metal Conducts Heat the Quickest?

Abstract: The purpose of the investigator's experiment was to find which metal conducts heat the quickest. Copper Clad, Stainless Steel, and Cast Iron were the metals tested. The investigator heated the metals on a stovetop burner and recorded the temperatures after two minutes. The results of this experiment show that Copper Clad conducts heat the quickest.

Project Number: MPH037

Grade: 8

Title: Electromagnet Strength

Abstract: The purpose of my project is to find out how many washers are picked up by coil wrapped around a nail at different amounts of times. The procedure of my project is to wrap the magnet wire 100 times around one of the nails. Next, I used a small piece of tape to attach the wire to the coil then use the alligator clips to connect the wire to the battery. I used the nail with the coils to pick up the washers. After that I did the same thing but the coil needs to be perpendicular to the washers. I would record how many washers were picked up each time. I tried it again with the coil wrapped 200 times and 350 times. In conclusion, I found that the more times the coil was wrapped around the nail the more washers it picked up. Also the nail picked up more with the coil being perpendicular than parallel.

Project Number: MPH038

Grade: 8

Title: What is the Best Parachute Design?

Abstract: The purpose of this project was to test and distinguish the most effective designs of parachutes for specific tasks. The experiment was executed by releasing three parachutes (one square, one rectangular, and one circular shaped) of exactly 0.3048^2 meters in size from an elevation of 3.9624 meters. The square parachute descended the distance in an average of 1.923 seconds, the circular in 1.669 seconds, and the rectangular in 1.36 seconds. Therefore, according to the data, the square parachute descended the slowest, and the rectangular the fastest, with the circular in between.

Project Number: MPH039

Grade: 8

Title: Store More - Hear Less

Abstract: My experiment's purpose was to help musicians and music lovers better understand MP3's. This could help them choose the compression rate to achieve balance between sound and file size. For my procedures, I imported music from various CD's and compressed them using different MP3 bit-rates. Each file was analyzed on the computer to find what was missing for each level of compression. Once reviewed, I found that more high frequencies were filtered out using more compression. At the higher compression rates the loss was noticeable to the listener. My experiment supported my hypothesis. Too much compression will degrade the sound.

Project Number: MPH040

Grade: 8

Title: Paper Airplanes - Small Width vs. Wide Width

Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH041

Grade: 8

Title: Hockey Speed

Abstract: In this experiment I am testing how fast a hockey puck travels when it is hit by a slap shot. To complete this I had to locate an empty gym or an arena. I gathered a hockey puck and a hockey stick. Next, I marked the locations on the court floor where the puck would be hit from. These locations varied from the center to the sides and back to front. The data showed that the location is not relevant only how hard the puck is hit.

Project Number: MPH042

Grade: 8

Title: Why Green: CFL or Incandescent

Abstract: Global warming is a perilous issue concerning the world today. This experiment is to determine whether fluorescent bulbs are a reasonable alternative to incandescent bulbs without compensating too much in light output. Two different light bulbs were lit and put near photosensitive paper. Their effect was measured on a scale and then compared. The conclusion was that the fluorescent light bulb is a reasonable substitute to an incandescent light bulb because its light output is very slightly less than the incandescent light bulb's light output, but it saves much more money per year in electricity costs.

Project Number: MPH043

Grade: 8

Title: What's Cookin'

Abstract: I wanted to know what type of alcohol burning stove is most efficient. I will construct different types of alcohol burner patterns using cat food cans. I want to see which type allows water to boil fastest. I will determine the efficiency based on how long the alcohol burns and how fast it boils water.

Project Number: MPH044

Grade: 7

Title: Generating Electricity

Abstract: The purpose of my project is to find out if more wraps of a thinner magnet wire would produce more electricity than less of thicker wire. Three generators were made with three different lengths and gauges. Generator one has 25m of 22ga, Generator two has 45m of 26ga wire, and Generator three has 60m of 30ga wire. I spun each one to see which one lit up the light the brightest. I determined that generator three did the worst and generator one did the best.

Project Number: MPH045

Grade: 7

Title: How Does Air Drag Affect a Soccer Kick?

Abstract: The purpose of the investigator's project was to see how air drag affects a soccer kick. The investigator would punt a soccer ball, and measure the distance it traveled with a tape measure. She did this experiment on a windy day and on a day without any wind. The investigator concluded that the ball will travel a shorter distance when it is windy outside. When it is not windy, the ball was not affected and went a farther distance.

Project Number: MPH046

Grade: 8

Title: Build A Bridge and Get Over It

Abstract: I will try to find out which bridge design supports the most amount of weight. I will use the same amount of popsicle sticks and white paper glue to construct each bridge. After construction, I will place the bridge into a bridge crusher. I will place weights on the crusher and note amount of weight the bridge withstood before breaking. I will do numerous trials on each bridge design. Compare my results.

Project Number: MPH047

Grade: 8

Title: How does temperature affect the strength of a magnet?

Abstract: Magnets are affected by many different factors, the strength of their field and their atomic structure. The main idea of my experiment is to better understand which factors affect them. The focus is how temperature affects magnet, to see whether they pull better when they are cooler, or hotter. A magnet will be tested in different temperatures with steel items, each 10 trials will be conducted under different temperatures, and results will be compared.

Project Number: MPH048

Grade: 7

Title: Efficiency of Solar Distillers

Abstract: Water is ubiquitous but often non-potable. I wanted to build a simple solar distiller and determine factors affecting the efficiency, including water/distiller color and the distiller's position. I build and validated an inclined distiller. I compared dyed and undyed water, and painted and clear distillers. Distillers in corners were compared to controls. Distiller color did not affect efficiency ($p=0.15$), but dyeing the water and corner placement had statistically significant effects ($p<0.01$). Benefit of corner placement (37% increase) was much larger than benefit of dyed water (12%). An optimal distiller would be unpainted, with dyed water, and placed in a corner.

Project Number: MPH049 **Grade:** 8
Title: Diet Soda vs. Regular Soda - Melting Ice
Abstract: The purpose of my project is to find out if ice cubes melt faster in diet or regular soda. I tested this by making 4 medium sized ice cubes. Two of the ice cubes contained food coloring and 2 of them did not. I then took the two regular ice cubes and put one of each in each of the different sodas, then observed and recorded what happened. I then did the same steps with the colored ice cubes. In result, the ice cubes melted faster in diet soda than in the regular soda.

Project Number: MPH050 **Grade:** 8
Title: Slipping in Southern Middle School
Abstract: The purpose of my experiment was to test which surface in southern middle school a person would be most likely to slip on. I conducted my experiment using a newto scale and a meter stick; with those two items I went throughout southern middle and hooked a size eleven point five sneaker to the scale and measured off ten centimeters and pulled on the scale until the shoe slid ten centimeters. I did that five times per surface. I concluded that students were most likely to slip on the marble in the bathroom.

Project Number: MPH051 **Grade:** 8
Title: She shoots, she scores!
Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH052 **Grade:** 7
Title: The Secret Behind a Curveball
Abstract: The purpose of this experiment was to determine why a curveball curves. To conduct this experiment I got a pitching machine and set it at 60, 70, 80 and 90 miles per hour. I let the ball hit the wall and measured how far from the ground the ball hit. This helped determine why a baseball curves. The results were that the higher the velocity the less the rotation affects the deflection on a baseball. The results indicated that the hypothesis should be accepted.

Project Number: MPH053 **Grade:** 7
Title: Potential and Kinetic Energy
Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH054 **Grade:** 7
Title: Singing Wine Glasses
Abstract: The purpose this experiment was to determine how water affects the pitch of sound using a crystal wine glass and different amounts of water. The results of the experiment were at 50 ml the pitch was loud because it had a lot of space to make a loud pitch in the wine glass causing a lot of vibration. When there is 100 ml of water there was still a loud pitch but didn't last long. With 150 ml of water the pitch started to get lower and shorter along with the vibration. When the glass had 200 ml of water the pitch was very low and short with little vibration. These results indicate that when the glass has less water the pitch is longer and higher causing a long vibration. When the glass has more water in it the pitch is shorter and lower causing little vibration.

Project Number: MPH055 **Grade:** 8
Title: Splatter Pattern! Get to the Point!
Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH056 **Grade:** 8
Title: Which metal conducts electricity the best?
Abstract: Electricity travels through loose electrons in a wire. Metals conduct electricity well because they have many loose electrons. For my project I tested copper and steel wires to determine which wire conducted electricity better. To do this I connected a circuit tester to the wire and set the tester to buzzer mode to determine if the wire conducted electricity. And I connected a tester to the wire and a battery and measured the loss of voltage through the wire. I determined that the steel and copper wires used in this experiment conducted electricity the same.

Project Number: MPH057 **Grade:** 7
Title: Water Evaporation

Abstract: I wanted to determine if air flow or heat causes water to evaporate the fastest. I will use distilled water and pour a certain amount on to sponges. Place one sponge on in front of a fan, another in front of a space heater, and one left to air dry. I will time how long it took for each to dry. Do ten trials of each. Average and compare the results.

Project Number: MPH058

Grade: 7

Title: When Squirrels Fly

Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH059

Grade: 8

Title: And the Kick Is Good

Abstract: On all footballs there is a recommended air pressure, but is that really when it will be kicked farthest? This experiment tests at which air pressure a football will travel the farthest. A kicking machine was used to test, which was a shoe filled with concrete attached to a steel bar which rotated around a bolt. My hypothesis was that the maximum kicking distance will occur when a ball is inflated to its recommended amount. The hypothesis was supported, the maximum kicking distance occurred when the ball was inflated to its recommended air pressure. When the ball was underinflated the kicking distance was lowest. The results show that the best kicking distance occurs when the ball is inflated properly.

Project Number: MPH060

Grade: 7

Title: Simple Machines

Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH061

Grade: 8

Title: Money Shot

Abstract: Does the material in the golf ball make a difference in the distance the ball travels or is it the force applied to the ball itself. I will build a ball hitting machine. Place a ball on the tee. Bring the club back, release the club, and record the distance the ball traveled. I will compare three types of golf balls. Ten trials of each. Average and compare the results.

Project Number: MPH062

Grade: 8

Title: Different Arm Positions of a Foul Shot

Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH063

Grade: 8

Title: Which Wood Burns the Longest?

Abstract: Winter was fast approaching and when my parents, went out to buy firewood they wondered which wood burns the longest. The purpose of this investigation is to determine which wood burns the longest. To perform the project the following procedures were used: gather all materials, then put up stone bed. Cut each wood equally, then put the first wood on the bed and light the sterno. Start the stopwatch. After wood is finished burning then stop the stopwatch. Redo the steps three more times for the same wood. Then redo all the steps again for the other three types of wood.

Project Number: MPH064

Grade: 8

Title: Magnetic Linear Accelerator

Abstract: The purpose of this experiment was to see how magnets can be used to accelerate a mass in a linear direction. Strong magnets were used and magnetic repulsion forces were shown to propel a mass on linear track. This physics experiment can be applied to uses in transportation and engineering.

Project Number: MPH065

Grade: 8

Title: Point of No Sound

Abstract: In my experiment I was testing which sound reduction material reduces the number of words I can hear from the song Point of No Return from "Phantom of the Opera" the most. Basically, what I did was use different sound reduction materials, placed a recorder in the material and played the song for a set amount of time, then counting how many words I could hear by comparing it to the control. That is how I conducted my experiment. When I played the song for the set time I could hear 123 words. The Results indicate that my hypothesis was true; I knew the thicker the sound material like the egg crate foam would have a better affect.

Project Number: MPH066

Grade: 7

Title: Does the Angle of a Solar Panel Affect the Potential Energy Collected?

Abstract: This project was based upon my interest in alternative energy. Different sources suggested different optimum solar panel angles, so I decided to find the best for the Pittsburgh area. I used two miniature houses, one a control house and one a variable house, to perform the experimentation. The control house was left at zero degrees while the variable house was changed in increments of ten degrees. Data showed a consistent control; the variable highs were seventy degrees and twenty degrees. I concluded that the best angle for a solar panel at mid-day is seventy degrees and in the afternoon, twenty.

Project Number: MPH067

Grade: 7

Title: Chill Out!

Abstract: My science fair experiment explored the topic of heat transfer through thermal conductivity. Thermal conductivity is how well a material conducts heat. To determine the better thermal conductor, liquid or gas, I cooled cans of carbonated and non-carbonated beverages. I placed three cans each of room temperature carbonated and non-carbonated beverages into ice, ice water, a freezer and a refrigerator. I measured the temperature of each liquid every ten minutes. I repeated this three times. The non-carbonated beverage cooled the quickest, in ice water. My results were as expected. A gas does not conduct heat as well as a liquid.

Project Number: MPH068

Grade: 7

Title: Which Type of Insulation is Best?

Abstract: The purpose of this investigation was to determine whether the type of insulation affects the temperature of an area. To conduct this experiment I used the following types of insulation: Fiberglass, Styrofoam, and Foaming. I put the three insulations into separate containers and placed smaller containers inside of the insulation -which was around the outside and placed- and placed 1 ice cube into each smaller container, each containing the same amount of frozen water. The results show that the fiberglass insulation had the least amount of melted water, while the Styrofoam had the most melted water due to large air pockets.

Project Number: MPH069

Grade: 7

Title: Biomechanics of Pitching

Abstract: The purpose of this experiment was to learn which pitching stance generates the most speed. The pitchers threw from various stances. The pitches were timed and pictures were taken to record the data. Pitch speeds were calculated as miles per hour. The back-step and the leg-lift stances produced similar pitch speeds. The stand-still stance consistently resulted in the slowest pitch speeds of the three stances. In all tests, regardless of the pitcher or object thrown, pitching with a starting motion increased pitch speed because the pitcher used his entire body instead of just his arm.

Project Number: MPH070

Grade: 7

Title: Salt Melting Ice

Abstract: I have always pondered if the salt people use to melt snow actually works and I used this project as an opportunity to discover this, myself. To do this project I froze water into ice then measured the amount of water melting & time it happened. Before I did this project I made sure I knew what I was about to do by researching ice, water, salt, freezing points, ect. At the end of my project my conclusion was when ice cream salt is on ice it melts faster than most other salts, including the rock salt used on ice.

Project Number: MPH071

Grade: 7

Title: Pumped Up

Abstract: The experiment I conducted is called Pumped Up. I chose this project because of my teammates who are always saying that the ball is too soft or too hard. In this project I kicked a soccer ball and measured the distance it traveled with different air pressures. After kicking the ball I recorded the distance traveled. The data I collected proves that too much pressure and too little pressure do not yield the best results. The best is to have the pressure at 6-8 pounds. In conclusion the recommended amount of air in a soccer ball gives the best results.

Project Number: MPH072

Grade: 8

Title: Cell Phone Chargers and Energy

Abstract: The purpose of my experiment was to determine which cell phone charger, when not in use, uses the least energy and how much it is wasting. To test my experiment I used two multimeters and six cell phone chargers. The multimeters recorded amps and volts which were multiplied by the number of hours per year. The oldest charger, the Motorola 8191WCXPA, used the most energy. The newest charger, the Pantech, used the least amount of energy.

Project Number: MPH073 **Grade:** 7
Title: Study of surface area in melting ice blocks
Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH074 **Grade:** 7
Title: Powering the Future
Abstract: The title of my science fair project is Powering the Future. I wanted to create a solar cell, and reveal the amount of amps produced from different watts. My hypothesis was that aq 150 watt light bulb will have the greatest effect on the amount of energy a photovoltaic cell produces. The procedure starts with six light bulbs of various watts. Each was placed into a gooseneck lamp that was positioned six inches above a solar panel. A multimeter recorded the amps produced by each bulb. This procedure was completed three times. Upon the completion, in each trial, the light bulb with the wattage of 150 produced the most amps. In conclusion, my hypothesis was correct.

Project Number: MPH075 **Grade:** 8
Title: Static power
Abstract: The purpose of my experiment is to find out if static electricity can be captured for everyday use as normal electricity. From my research, I found a device called a Leyden jar that can capture electricity of any form and hold it to be used for later. My hypothesis is I believe that static electricity could be used in a current to power other devices. I have not yet completed my experiment, and therefore I have no results.

Project Number: MPH076 **Grade:** 8
Title: H2O Power
Abstract: The title of my science fair project is H2O Power. I wanted to see if the velocity of the water that falls over a paddle wheel effects how many volts it will produce. My hypothesis was that when the faucet handle was turned 90 degrees it would produce the most volts. My procedure started with constructing a paddle wheel out of balsa wood. Next, I turned the faucet handle to the various angles. The volts that were produced were recorded with a volt meter. The procedure was completed three times. Upon the completion of all trials, the faucet handle that was turned to 90 degrees produced the most volts. In conclusion, my hypothesis was correct. The 90 degree angle produced the most volts.

Project Number: MPH077 **Grade:** 7
Title: How does drag affect the speed of a swimmer?
Abstract: Please visit student's exhibit for the abstract.

Project Number: MPH078 **Grade:** 8
Title: Heat Lost
Abstract: The purpose of Heat Lost was to see which material insulates better, rocks, cotton, newspaper, sawdust, or Styrofoam. Build the outer test box. Build the inner test box. Build bracket to hold thermometer probe over beaker. Place beaker inside inner test box with 500ml. of boiling water surrounded by the desired insulation between the outer and inner test boxes. Test every half-hour for eight hours. Styrofoam was the best with the starting temperature of 80° then at the end it was 15°. Cotton went from 76°-12°. Newspaper went from 79°- 12°. Sawdust went from 74°- 10°. Rocks went from 80°- 11°. Therefore not all materials are good insulators.

Project Number: MPH079 **Grade:** 8
Title: Sound Spectrum
Abstract: A musical instrument was played by a volunteer into a microphone. A tuning fork served as the control. The instrument was played with varying degrees of intensity. This procedure was repeated for 10 repetitions. The microphone recorded the sound waves of the instrument and a computer recorded the variations in microphone voltage. This gives a transverse wave description of the sound wave. The relative amplitude of each harmonic was recorded. The frequency and amplitude was analyzed.

Project Number: MPH080 **Grade:** 7
Title: Creating Energy
Abstract: My project was to find how much electricity different windmill blades produce. When doing my project I found that different windmill blades; wood, tin, and plastic, collect different amounts of electricity. I hypothesized that the tin blade would work the best in collecting electricity. My hypothesis was proven to be correct after doing three trials.

Project Number: MPH081 **Grade:** 8

Title: The Effect of Angle of Trajectory on Distance

Abstract: I hoped to prove which angle would launch a projectile the farthest. I had to launch a golf ball from my catapult. I marked where the ball landed each time. I found that when I launched the ball at a 45 degree angle, the ball went the farthest. The farther away you get from 45 degrees, the shorter the distances are. The complimentary angles were supposed to be the same. They were pretty close. My hypothesis was correct. My results could be important to anyone who needs to throw something far, such as a football player.

Project Number: MPH082 **Grade:** 8

Title: Sugar Crystal

Abstract: My experiment purpose was to see whether sugar crystals grow better in warm or cold temperatures. In this experiment a sugar solution was divided into 3 quart jars with a piece of string tied to a flat pencil on the top. The room temperature jar grew the crystals faster and larger than the other two jars. The refrigerator did the worst and the jar under the heat lamp was in the middle. In conclusion the room temperature is the best to grow sugar crystals.

Project Number: MPH083 **Grade:** 8

Title: Magnetic Force and the Climate

Abstract: In my project I wanted to determine which magnet would have the strongest force after contained in a certain climate. I thought that the magnets heated in the oven would hold the strongest force. I placed each magnet in it's controlled climate and kept them in there for an hour. Once done, I placed them over the paperclips and recorded the results. My hypothesis was not supported by the data, because the magnets in the freezer held the strongest force.

Project Number: MPH084 **Grade:** 8

Title: SUV's are a Drag

Abstract: The purpose of this investigation is to determine if new SUV's have less drag than older ones. Using a GPS system, a 1998 Ford Explorer, a 2002 Ford Explorer, and a 2008 Ford Explorer were driven on a flat road to 96.56km/hr. The accelerator was let off, and a stop watch started until car reached 48.28km/hr. The time was recorded. The 2008 slowed the fastest. The 1998 slowed the slowest. The masses of the vehicles were recorded. The values were used to calculate drag for each vehicle. The 1998 had the lowest drag, the 2008 had the highest drag. It appears that the mass of the vehicles keeps increasing and that decreases drag, irregardless of the aerodynamic improvements. The luxury components that increase the mass must go in order to get better fuel efficiency.

Project Number: MPH085 **Grade:** 8

Title: The Output Voltage Of a Wind Turbine

Abstract: I chose this topic to see if wind turbines produced a lot of energy or not. I hoped to prove that wind turbines are helpful and produce lots of amounts of energy. To determine how much energy they produce I built a model of a wind turbine. I used a hair dryer to get it to move and measured the volts after thirty seconds of blowing on it. The data proved that the faster the wind the more energy produced. My conclusion was that based on my results wind turbines produce lots of energy.

Project Number: MPH086 **Grade:** 8

Title: Follow Through

Abstract: The purpose of this experiment was to show whether or not a follow through is needed in a kick or swing to get maximum distance. Before actually performing the experiment, I made a swinging contraption out of wood, nails, and a dowel rod with various tools. Once the swing was built, the actual testing began. The hanging board was raised until it touched the top of the swing, and dropped. This was done 15 times letting the board follow through to natural completion, and 15 times with the board stopped when it hit the golf ball. The average distance for the follow through was 10.12 meters and 10.14 meters for stopped at impact. The hypothesis was not supported. In theory, a follow through is not needed if one was to swing or kick exactly the same each time.

Project Number: MPH087 **Grade:** 8

Title: Putting Perfection

Abstract: How does the center of gravity affect the motion of a golf ball? Nine golf balls were manually balanced by spinning them in Epsom salt and water. The spinning motion distributes the weight. Each golf ball was hit three times on a putting green. The distance the ball stopped from the cup was measured. The experiment was done a second time and one variable changed. Nine new unbalanced golf balls were

tested. The unbalanced golf balls rolled toward the left of the cup. Their weight was not evenly distributed. The center of gravity does affect the motion of golf balls.

Project Number: MPH088

Grade: 7

Title: How water temperature affects soap

Abstract: The purpose of my experiment is to see if water temperature affects soap. First i put a tea spoon of soap in the beckon then i got boiled, warm, cold, and ice water i put one tpye of water in then i measured the bubbles then i repeated. My hypthesis was right the boiled water got the more bubbles then the cold or ice cold water.the boiled water got the most bubbles, warm came in second, cold came in third , and last was ice water.

Project Number: MPH089

Grade: 8

Title: Insulation Experiment

Abstract: The purpose of this project is to see what insulation is the best. The procedures used are put water in a mason jar with insulation around it in a bag. Put the experiment in the refrigerator for fifteen minutes then take it out and immediately put bake in fridge after you take the temperature. After we were done we put the data on a line graph. My conclusion is that the thinsulation kept the jar warmest in the extreme conditions of the refrigerator.

Project Number: MPH090

Grade: 8

Title: Temperature effects on football throwing distance

Abstract: The purpose of this investigation was to determine whether or not the temperature of a football affected the distance a football traveled when thrown. The investigator tested 7 subjects. Each subject was required to throw a preheated football two times. The distances were recorded. Then, each subject was required to throw a cool football two times. The distances were recorded and average distances were calculated. The investigator concluded that, on average, the cool football traveled farther than the warm football.

Intermediate TEAM

Project Number: MTM001

Grade: 8

Title: Air vs. CO₂

Abstract: The purpose of this experiment was to see if using carbon dioxide rather than air would affect how a hovercraft hovers. To conduct this experiment we ran the hovercraft three times with air and three times with carbon dioxide. The experimental results were measured by observing each trial of each and rating it on a scale of 0 to 5. The results of the experiment were that the carbon dioxide was three then two. The air was four. The results indicate that the hypothesis should be accepted. The carbon dioxide made the hovercraft hover worse all three trials.

Project Number: MTM002

Grade: 8

Title: Cliques: Cool or Not?

Abstract: Please visit student's exhibit for the abstract.

Project Number: MTM003

Grade: 7

Title: Did I Order This?

Abstract: Water is a popular beverage of choice for many who dine at restaurants. We conducted a survey and results show that 53% of our peers order water as their beverage when they dine out, 36% orders a soft drink as their beverage and 11% order other beverages. The purpose of our work is intended to find the cleanliness of four local restaurants drinking water. We tested the water for eight contaminates including pH, Hardness, Chlorine, Nitrites, Nitrites/Nitrates, Lead, Bacteria and Pesticides. Each restaurant has suitable levels for drinking water of the eight contaminates. Future work is intended to test Napoli's further.

Project Number: MTM004

Grade: 8

Title: Dissolving Meat

Abstract: Hello and my project is on the acid in Coca Cola and Pepsi soda drinks and some lunch meat and see which dissolved the meat the most. The purpose of me doing this project was to see if Pepsi or Coca Cola had the most acid. I also wanted to see which one could dissolve the meat the most. What I will do to find this out is put a piece of each lunch meat in eight pans or bowls then pour Coca Cola in four one four each meat. I am going to do the same thing for Pepsi. Then I am going to keep it in there for a week. I will measure the meat and see the difference of length to the start and finish. I will also collect my data too.

Project Number: MTM005
Title: Don't Forget to Protect

Grade: 8

Abstract: The purpose of our experiment was to determine the effectiveness of two sunscreens, Aveeno and Banana Boat. The sunscreen was put on Saran Wrap; then placed over yeast colonies on Petri dishes. To check our experiment, we used color changing UV beads. To measure, we counted the yeast colonies and recorded the color change in the beads. The results were, Aveeno had the greatest amount of yeast cultures left, but Banana Boat had the greatest amount of color change. We rejected a null hypothesis. Banana Boat worked best for the beads, but the yeast culture test was more effective.

Project Number: MTM006
Title: Fruit Ripening

Grade: 8

Abstract: In our experiment first we are going to take two bananas and put one in a bag and the other not. Then we will take two more bananas and put one in direct light and one in the dark. Finally we will take two more bananas and put one in the refrigerator and one in room temperature. Then we will see which fruits ripen faster in each condition. Our materials are six bananas, plastic bag, a light, and a refrigerator. We predict that the banana out of the bag will ripen faster. We also predict that the banana in the light will ripen faster. Finally we predict that the banana out of the refrigerator out will ripen faster.

Project Number: MTM007
Title: Old, Mold, and Moldy

Grade: 7

Abstract: For our project we compared seven different food substances, and placed three different environments. The food substances are cheese, bread, cucumbers, eggs, sour cream, strawberries, and potatoes, and the three environments are dry room, moist room, and refrigerator. The results were that the sour cream has the most mold, although it did not show the growing mold first. The food substance that had the first mold growing on it was the potato. Out of all three environments the moist environment had the most mold growing on the substance that was placed there.

Project Number: MTM008
Title: Rust On Rust Off

Grade: 8

Abstract: In this project we tried to compare whether WD-40, phosphoric acid, or electrolysis would be best to remove rust. To test, we designed our home-made electrolysis machine, used naval jelly, a gel form of phosphoric acid, and WD-40, and tested each form of removing rust. We first used electrolysis to add a controlled amount of rust. We had three trials of each method. We concluded that, phosphoric acid worked the best, most efficiently and effectively.

Project Number: MTM009
Title: See the Rainbow

Grade: 8

Abstract: See the Rainbow -- The purpose of this project was to determine which food dyes are used in Original Skittles®. The hypothesis was that Red Dye #40 is the most common. Chromatography experiments were performed using McCormick® food dyes as the known dyes, and each Skittles® color was eluted using coffee filters. Salt water, vinegar and ammonia were used as the eluent solutions. Retention factors were measured for all separated dye fractions. The hypothesis was correct. Red Dye #40 was best separated in ammonia, was eluted first as a pink color, and was identified in three of the five Skittles®.

Project Number: MTM010
Title: Solar Energy! Magnify It!

Grade: 8

Abstract: The purpose of our experiment was to prove that solar panels could become more efficient with the help of magnification. This was done by placing a magnifying glass over the solar panel and measuring it. With no magnification it only measured to 2.5 DC volts. When the magnifying glass was an inch over the solar panel it measured to 3 DC volts. At 3 inches, the solar panel produced 2.75 DC volts. At 5 inches, it produced 3.25 volts. Lastly, at 10 inches, it created 3.5 volts. With magnification, the 2x2 solar panel produced one volt more than it usually would have. We thus concluded that our hypothesis was right and magnification does indeed help boost the power of a solar panel.

Project Number: MTM011
Title: The Stroop Effect

Grade: 7

Abstract: The Stroop Effect test is a challenging mind game that is interesting to learn about. During our project, we tested different age groups to fully understand how the Stroop Effect challenges your mind to multitask. We made

a Stroop effect test by writing colors that are visually displayed in a different color. Then we used a stopwatch to time people on their speed and accuracy on this effect. The results and conclusion turned out that if you are very young or old, you have a difficult time with this, unlike middle aged people.

Project Number: MTM012

Grade: 8

Title: Water, Soil, Seeds, and pH OH MY!!!!

Abstract: The purpose of this experiment was to see which river water and soil would grow a bean seed the most effectively. To conduct this experiment we gathered water and soil samples, and then used the soil and water to grow a bean seed. The experimental results were measured by observing the progress of the growing plants each day. The results of the experiment were that none of the plants grew effectively with being watered by river water. Our hypothesis should be rejected because the Allegheny River did not grow a bean seed the most effectively.

Project Number: MTM013

Grade: 7

Title: What drinks will plants like best?

Abstract: Our experiment was to find out which plant would be taller and healthier. We gave them different kinds of nutrient fortified drinks and natural water. The purpose was to help indoor plant owners to grow plants faster and healthier. We watered the plants every other day for 15 days. The plants sprouted in about 4 days. Our results showed that the Vitamin Water plant was the tallest and the healthiest. The V8 was the smallest (Layer of V8 on the soil). The control and the precipitation water were neck and neck.

Project Number: MTM014

Grade: 7

Title: Take a Deep Breath!

Abstract: As a result of consistent aerobic activity, do athletes have a larger lung capacity than non-athletes? Is there also a difference between males and females, since males have larger lungs? These were questions addressed in the science project. A group of 10 7th graders (5 males/5 females) breathed into a peak flow meter. Each subject completed three trials with adequate rest in between each trial. It was determined that athletes do have a larger lung capacity and the male subjects recorded a higher reading than the females supporting our hypothesis.

Project Number: MTM015

Grade: 8

Title: Hypersensitive Hearing

Abstract: For our science project, my group will try to find people's hearing with a application on an I-phone. We will test our subjects in hertz and go from a low tone to an extremely high tone until they cannot hear any longer. The average humans hearing is around 15000 htz while hypersensitive hearing starts around 20000 htz. Our test will show at what age you can lose your great hearing.