



66th PITTSBURGH REGIONAL SCIENCE & ENGINEERING FAIR

INTERMEDIATE DIVISION ABSTRACTS

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Pittsburgh Regional Science & Engineering Fair is a major event of the SciTech Spectacular

TABLE OF CONTENTS

	PAGE
INTERMEDIATE DIVISION	
BEHAVIORAL AND SOCIAL SCIENCE.	1
BIOLOGY.	9
CHEMISTRY.	19
COMPUTER SCIENCE/MATH.	29
CONSUMER SCIENCE.	31
EARTH/SPACE/ENVIRONMENT.	40
ENGINEERING/ROBOTICS.	48
MEDICINE/HEALTH/MICROBIOLOGY.	53
PHYSICS.	62

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS001

Grade: 7

Title: Memory Measurement

Abstract: People love to listen to music when working, but does this affect their work. This experiment is intended to see if people can remember a number better when they're not listening to music or when they're listening to rap music. Ten subjects were given six numbers to study for ten seconds then remember for one minute then right down what they remembered. It was found that people could remember them better when they were not listening to music. Research shows that if the experiment was done with classical music then the subjects would do better when listening to music.

Project Number: MBS002

Grade: 7

Title: Memory Retention

Abstract: At school students use two different senses for memory retention. One is Iconic (visual) and the other is Echoic (hearing) Memory. To determine which was superior a memory test was conducted on sixth and seventh graders. There were two lists of 15 words, one was shown to the students and the other was recited to the students. The experiment was done on two different days. Results showed that Iconic memory was superior for memory retention. Further work may include an interview with a psychologist to get his analysis on the results.

Project Number: MBS003

Grade: 7

Title: Colors Effect on the Eating Habits of Dumbo Rats

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS004

Grade: 8

Title: Flashbulb Memories: How Much Do You Remember?

Abstract: Flashbulb memories are vivid, detailed memories. This research tests whether flashbulb memories are stronger among people who lived close to New York City on September 11, 2001. Samples of eighth grade students in a suburb of New York City and in suburban Pittsburgh completed a survey to describe their memories of 9/11. The responses were scored using the characteristics of flashbulb memories, and each response's words were counted to measure its detail. Statistical tests indicate the data supports the hypothesis that people living close to New York City on 9/11 have more intense flashbulb memories than people in Pittsburgh.

Project Number: MBS005

Grade: 8

Title: The Stroop Effect

Abstract: While surfing online, I discovered a test for the Stroop Effect, which lists words of colors but the words themselves are in a different color. As I was completing the difficult test, I wondered if my age had any effect on my ability to correctly complete the test. Volunteers from three different age groups completed the Stroop test. Data for accuracy and time needed to complete the test were recorded. My results show that some words were read consistently incorrect and the oldest age group completed the test the quickest.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS006

Grade: 7

Title: How Does Memory Affect Us?

Abstract: As I have learned through my research, short-term memory has a big effect on our lives. The purpose of my experiment was to compare how memory varies according to age and gender. I tested a group of people of different ages and genders. Each person was shown a series of pictures for two minutes and asked to recall as many items as they could for five minutes. As my data shows, short-term memory decreases with age. Females scored slightly higher than males. According to studies, these results were not surprising, but I did not expect such dramatic results. As I have learned through my research, short-term memory has a big effect on our lives. The purpose of my experiment was to compare how memory varies according to age and gender. I tested a group of people of different ages and genders. Each person was shown a series of pictures for two minutes and asked to recall as many items as they could for five minutes. As my data shows, short-term memory decreases with age. Females scored slightly higher than males. According to studies, these results were not surprising, but I did not expect such dramatic results.

Project Number: MBS007

Grade: 7

Title: Maze Madness

Abstract: Music can affect the way you study. The subjects each performed the maze once while listening to music and once while not. It was recorded how many times the subject touched the wall. This proves whether music affects the way you concentrate while performing an action. This project was performed because some people study with music and it was to prove whether it made your studying better or worse. The results were that the people touched the wall more times when they were listening to music and less when they were not. Next year gender will be tested for differences.

Project Number: MBS008

Grade: 8

Title: Learning Styles On Braille

Abstract: The purpose of my science fair project was to see if a person's learning style affected his or her ability to memorize the Braille alphabet. I also wanted to see if I could teach Braille by auditory methods. I tested a total of 20 students according to their learning style. From my results, I found that auditory learners did the best and combination learners did the worst. In conclusion, a person's learning style does affect his or her ability to memorize the Braille alphabet and Braille can be taught by auditory methods.

Project Number: MBS009

Grade: 8

Title: Reading Rates & Colors

Abstract: Can reading rates and comprehension of 8th graders be affected by the color of the paper containing the reading passage. Seven different colors of paper were used: white, red, orange, yellow, green, blue, and violet. Volunteers read the story on every color of paper and the number of words they read in a minute were recorded, any mistakes made were recorded, and the pursuit and saccade eye movement were recorded. Comprehension was also tested using 10 questions. From my data, I can conclude that the color of paper does not affect the rate at which you read nor reading comprehension.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS010

Grade: 8

Title: Optical Illusions of Men -vs- Women

Abstract: Do our eyes see what is really there? This work intended to see if men and women visualize things differently. A book of twenty pictures containing two different images and six trick illusions was created and used in the testing sessions. Sixteen men and women were asked to view the album and indicate the first image seen. The responses were recorded and analyzed. It was determined that there was no significant difference in how men and women viewed the images.

Project Number: MBS011

Grade: 7

Title: Saving Lives in Work Zones

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS012

Grade: 7

Title: Rx for Dr.-Patient Communication

Abstract: A patient's understanding of medical instructions can often mean the difference between life and death. Recent studies have shown that out of 180 patients that underwent oral surgery, a large percentage of patients did not remember either oral or written instructions. More patients remembered instructions when given in both forms. This experiment intended to determine which instructions a patient will understand best: oral, written, or a combination of both. After conducting this experiment and analyzing the data, it was found that the patients remembered more of the medical instructions when given in both oral and written forms. Reinforcing oral directions with written instructions can literally save a life.

Project Number: MBS013

Grade: 7

Title: Which is Easier - Audio or Visual Test?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS014

Grade: 7

Title: Does Text Color Affect Memory?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS015

Grade: 7

Title: Auditory Vs. Visual Learning

Abstract: This project was conducted to see if students learn better visually or audibly. The students were placed in a room and read a story to. Then they were given a quiz. The following week they took another quiz on what they had learned the week before. Then they read a story to themselves. After that they took another quiz. Then the last week they took another quiz on what they had learned the week before. The result was that the students learned better visually than audibly.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS016

Grade: 8

Title: The Effect of Noise on Hand Eye Coordination

Abstract: I selected this topic because it is something that might benefit me in the future since I hope to play professional basketball. By doing this project I want to prove that people get distracted by different things and practicing really does make a difference. For my project I ran a route and my friend threw me the ball. Before I got it they'd try and distract me by clapping, yelling, blasting music, or stomping. My results did not match my hypothesis. I thought music would affect me the most. This project has taught me ways to not get distracted as easily. Many people say practice makes perfect and this is a great way to prove it.

Project Number: MBS017

Grade: 7

Title: Are Children Better at Pronouncing a Foreign Language?

Abstract: The purpose of my experiment was to find out whether children or adults are better at pronouncing foreign language words. The procedure was to record the pronunciation of typical German words by non-German speaking participants from different age groups, score the accuracy of the participants' pronunciation and compare the participants' scores to their age. Based on the pronunciation scores of fifty words by ten participants from five age groups, the conclusion of my experiment is that children, especially at a young age, are more accurate than adults in pronouncing foreign language words.

Project Number: MBS018

Grade: 8

Title: Color, Pictures, and Perception

Abstract: If a picture is worth a thousand words, which is worth most of those thousand words, the color scheme or the contents? I selected this experiment to benefit any inquisitive people or visual artists, and give people a way of changing the way they live their lives by making alterations with the colors they see every day. I performed this experiment by drawing five pictures that express one dominant emotion on 10 sheets of white paper, copying each of them and coloring them each with a different color scheme. I discovered that colors, pictures, and personalities directly varied with each other.

Project Number: MBS019

Grade: 8

Title: Effect of Cueing on Memory

Abstract: Behavioral Science is very interesting. The effect of cueing, the physical presence of something that will aid in memory, has been relatively unexplored. The amount of research that has already been done points to the conclusion that this practice will aid in memory. Since smell can be used in cueing it has been used to see the effects when testing memory. The conclusion gathered from the experiment shows the aroma of lavender seems to do best in the testing of memory.

Project Number: MBS020

Grade: 8

Title: Video Game Advantage

Abstract: Video Games are now common in America. This begs the question, "What effect do they have?" That question initially prompted my research on this topic. My purpose was to see if playing video games affects reaction time. I believe if people who play an extensive amount of video games have a better reaction time than people who do not play video games, then playing video games indeed does improve reaction time. I only needed a ruler, forty surveys, and forty

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

test subjects. I surveyed a group of random people: and tested their reaction time using the ruler. It was determined that playing video games increased reaction time.

Project Number: MBS021

Grade: 7

Title: Color's Effect on Depth Perception

Abstract: Do colored lenses alter your depth perception? This experiment was intended to find an answer to that question. It was hypothesized that the color red will alter an individual's depth perception more than a lighter colored lens. Seven different lenses were tested: clear, yellow, blue, green, pink, red, and taupe. Twenty subjects were tested on bat and ball skills, four puzzles, and the children's game Operation. The results showed that the pink and taupe lenses did increase depth perception, while yellow and red did not. Further research showed that color contrast plays a large role in visual acuity as well as depth perception. The hypothesis was shown to be correct in this experiment.

Project Number: MBS022

Grade: 8

Title: To believe or not to believe?

Abstract: Superstitions can be very misleading and few people understand them. Most superstition origins have been lost within the mists of time. The reason why many people believe in these superstitions are for luck and that is interesting because some people don't even know what they mean. Five different good luck and bad luck superstitions were researched on the internet to create a questionnaire for students. Fifty students were asked their beliefs about all of the good luck and bad luck superstitions. According to my data students believe more bad luck superstitions than good luck superstitions.

Project Number: MBS023

Grade: 8

Title: Riding to...Recovery?

Abstract: Autism is a neurological disorder that is sweeping the nation, which at the present time has no known cure. Even though there is no way to cure this disorder, therapists and psychologist have found ways to help, and treat some of the symptoms presented in Autism. This experiment was conducted in order to see if horseback riding was an effective means of treatment for children with Autism. One Autistic boy was observed engaged in therapeutic riding classes, which were focusing on the development of positive social and behavioral interaction skills. Observations made during the experiment revealed that the child's response to verbal directions, compliance to tasks, eye contact and object identification skills improved by the end of the testing period. Based upon these observations, one can state that intensive therapeutic horseback riding sessions have been successful in helping this child learn the skills identified.

Project Number: MBS024

Grade: 8

Title: Do You Remember?

Abstract: I was struggling to remember dates in history class one day so I wanted to find a way I could improve my memory. I made three tests. Each test had either three numbers, four numbers, or seven numbers typed in the center of the page. I tested 25 boys and 25 girls to determine how many numbers they remembered from each test. I found out that people remember smaller numbers (the three number test) best over the tests with four or seven numbers.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS025

Grade: 8

Title: Music on the Mind

Abstract: Music is a great thing, and everyone listens to it. Many times it is played in the background of various activities such as studying or using the computer. My project was to test people and their ability to concentrate with two different types of music. My theory was that the concentration would be better when there was classical music, rather than heavy metal. I tested my subjects with a scrambled word test. After my experiment was conducted, I found classical music to be the best for concentration.

Project Number: MBS026

Grade: 7

Title: A Study of Computer Based Learning over Traditional Classroom Teaching

Abstract: The goal of this study is to determine if computer-based learning is more effective than traditional learning in foreign language classes. The hypothesis to be tested is that children will learn more foreign language vocabulary when the lesson is presented using a computer rather than using traditional classroom methods. Two lesson plans will be prepared in German. One set of German vocabulary words will be taught using an interactive computer website. A second set of German vocabulary words will be taught utilizing a traditional classroom lesson plan. Students in grades 6,7 and 8 will be taught using both methods and then tested for comprehension. Their scores will be recorded, averaged, graphed and analyzed to determine which teaching method is most effective. Language test scores are dropping nationally and the goal of this project is to find the best method to use to teach students languages so that scores nationally will improve.

Project Number: MBS027

Grade: 8

Title: Determining which NCAA division 1A football ranking system is most unbiased

Abstract: My purpose of this science fair project was to see which of the 6 NCAA Division 1A football ranking systems is most unbiased. I chose to do this because it will help sports fans and others to know which ranking system to look at for accuracy. To perform this experiment you must visit the NCAA ranking systems sites and record the data. In my experiment I received a very distinct answer to my question. The most unbiased ranking system was the Colley Matrix Ranking System at 22% accuracy.

Project Number: MBS028

Grade: 7

Title: Computerized vs. Paper and Pencil Tests

Abstract: Test-makers such as those from the American Teaching Association claim that the scores of the computerized and paper and pencil tests are equivalent, but this is inadequately supported. This experiment intended to discover if there is a difference in the computerized and paper and pencil test scores. Fifty subjects were given timed tests using both methods; the computerized version was accessed at quizlab.com. Results showed that the scores of the paper and pencil tests were not significantly higher than the computerized tests.

Project Number: MBS029

Grade: 7

Title: Brainpower to Study Habits/Hobbies

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS030

Grade: 8

Title: Jingle Jumble

Abstract: While walking down the school hallways, I always hear the singing of slogans such as Cha Cha Cha Charmin. I wondered if these people knew that they were singing about toilet paper or if they just got the song stuck in their heads. I created a test with 24 slogans (12 older and 12 newer). I distributed the test to 50 people from each of the following groups: 6th, 7th, and 8th graders and adults. I concluded that adults knew the most slogans and the 6th graders knew the least.

Project Number: MBS031

Grade: 8

Title: Quiet, I'm Working

Abstract: Recent research studies have focused on the effects of various types of music on the ability to concentrate in a work environment. It was hypothesized that subjects would detect the most errors in reading passages during the "soft rock" trial, and the least errors during the "rap" music" trial. Six tests were constructed with 30 "letter envelope" mistakes in reading passages, using a procedure from "Features and Objects in Visual Processing", Scientific American, by Dr. Anne Treisman. One of the five different types of music was played for each timed trial, and the sixth timed test with no music played served as the control. The hypothesis was not supported; it was found that the subjects circled the most errors during the trial with no music.

Project Number: MBS032

Grade: 8

Title: Do Cats Have a Favorite Color?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS033

Grade: 7

Title: What Lets The Worms Out?

Abstract: The pupose of my project was to find out what would happen to worms if I applied heat and electricity to the wet ground. My hypothesis is: I think if I provide heat and electricity to the wet ground, then the electricity will work best. My hypothesis was correct because more worms came to the surface compared to the heat. I learned that worms move by using the tiny bristles on their bodies. I also learned that a device called a "Worm Getter" was recalled because people were getting hurt. Also, the seasons can really effect the worms.

Project Number: MBS034

Grade: 7

Title: The Senses and Memory

Abstract: Studying is part of learning and homework. This experiment wanted to find out which sense helped memory work the longest. Students used their senses of touch, vision, smell, taste, and hearing to help their memories. Individually students went through the sense experiment and three days later were asked to remember the original experience. The sense of sight gave the most support. Future work would include larger groups of students and more time between tests.

INTERMEDIATE DIVISION - BEHAVIORAL/SOCIAL SCIENCE

Project Number: MBS035

Grade: 7

Title: Do Video Games Affect Heart Rate?

Abstract: Does playing video games affect the heart rate of 7th grade boy? Many young boys spend a lot of time playing video games. Many of them say this is their favorite thing to do after school. While playing video games many boys appear to really get involved in the challenge that the game holds. I wondered if playing these games has an affect on the heart rate. I selected two games, one a car racing game and the other a football game. The heartbeat was taken before the individual started to play and after two minutes of playing each game. The results were inconclusive. Some boys heart beat increased while others decreased or stayed the same. It appeared when the boy was winning his heartbeat decreased or stayed the same. When not do well at the game and becoming agitated, the heart beat increased.

Project Number: MBS036

Grade: 8

Title: Does Music Affect Heart Rate?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBS037

Grade: 7

Title: The Secret Science of Super Swimmers

Abstract: Everyone saw Micheal Phelps rule the pool at the 2004 Olympics. What you didn't see was how he and his teammates became fast enough to challenge the world's champions. My body of work questioned what factors cause a swimmer to improve over one swim season. I studied two YMCA teams and examined the factors of age, gender, experience, and practice frequency. Each swimmer's starting and ending times were documented and their percent improvement calculated. Number of years experience proved to have a strong inverse relationship to percent improvement. Experiments examining increases in weight and height versus improvement are planned.

Project Number MBS038

Grade 8

Title: What's That Smell

Abstract: This project tested how well a person could smell without the sense of sight.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI001

Grade: 8

Title: Who Has The Better Percentage?

Abstract: Since I am a basketball player I was wondering if people with a specific left or right hand and eye dominance had a difference in skill level with foul shots. Volunteers with the same skill level but different hand and eye dominance were chosen. Volunteers shot free throws while closing their left eye and then their right eye on five different days because there is a possibility that a person could have an "off" day when shooting foul shots. Foul shot percentages were calculated and compared showing that hand and eye dominance does not affect foul shot percentages.

Project Number: MBI003

Grade: 7

Title: Macro Invertebrates & Water Quality

Abstract: In order to test the water quality of the streams at Frick Park and Squaw Run Park, I conducted six tests and collected macro invertebrates at the same four locations as last year's research. I expanded previous research in order to identify if collecting macro invertebrates is a better indicator of water quality than other tests. Tests showed that both streams have poor water quality, yet the macro invertebrates collected indicated three of four locations have excellent water quality. Results were inconclusive because of flooding just prior to testing. Additional tests and research into the effect of flooding are required.

Project Number: MBI004

Grade: 7

Title: DNA Extraction

Abstract: An organism's genetic code is controlled by its DNA. Numerous bands of DNA make up genes, which in turn comprise chromosomes. These chromosomes are found in body cells (somites) and sex cells (gametes). The composition and amount of DNA varies from species to species. A comparison study of the amount of DNA present in an animal species and plant species was conducted. A chicken is more complex than an onion. The chicken should have a heavier amount of DNA to accommodate the more numerous genes that are present on its chromosomes. Experimentation proved this to be true.

Project Number: MBI005

Grade: 8

Title: Color Change in Green Anoles

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI006

Grade: 8

Title: How to See Vitamin C

Abstract: Vitamin C is required for good health and is not produced by the body. This work intended to determine the amount of vitamin C in various foods, juices and vitamin tablets. It was also intended to demonstrate vitamin C's anti-oxidation abilities by crushing a vitamin C tablet and sprinkling it on pieces of apple. The antioxidant property of fruit juices was also compared. It was determined that lemon juice prevented enzymatic browning the best.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI007

Grade: 7

Title: Types of Water on Plant Growth

Abstract: Some people spend more money than is needed on special types of water for their plants. The purpose of this investigation was to determine if the type of water affected the height of the plant. Five cups with soil and grass seeds were watered with tap water, five watered with mineral water, five with distilled, and five with purified. They were observed over three weeks, and overall tap water had the greatest gain in height, mineral placed second, distilled placed third, and purified came in last. Future studies could include observing the plants over a longer period of time.

Project Number: MBI008

Grade: 8

Title: Memories

Abstract: Does memory improve, decline, or stay the same with age? I wanted to see if you have a better memory when you are younger or when older. I hypothesized that the young adults/teenagers would have the best memory, because I feel their memory is at its best at this age. First, I took 16 volunteers, 4 kindergarteners, 4 teenagers, 4 adults, and 4 older adults. I allowed the volunteers to stare at a poster board with 20 pictures on it for one minute. After, I took the pictures away and let the volunteers tell me what they remembered. I recorded their responses. I did this a total of 16 times, once with each person. Out of all the age groups, the teenagers did the best, remembering 76% of the pictures, the adults came in second, remembering 62%, the older adults next with 51% and the kindergarteners last with only 31%. My hypothesis was proven correct.

Project Number: MBI009

Grade: 7

Title: Microwave Radiation: Helpful or Harmful for Plant Growth

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI010

Grade: 8

Title: Plant Growth and Germination

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI011

Grade: 8

Title: Alternative Farming Methods

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI012

Grade: 8

Title: Mold and Magnetism

Abstract: Mold can be a big problem for homeowners. It can cost thousands of dollars to repair its damage. I thought that maybe an electromagnet could slow it down or stop its growth altogether. I had two samples of bread, one with an electromagnet close to it, and one without an electromagnet. I recorded the mold's growth and found that the electromagnet actually made the mold come faster and fill the bread faster. In the future, I may test if electromagnets affect the growth of plants.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI013

Grade: 8

Title: Zed Zeppelin & Plants

Abstract: To discover the effect of different Zed Zeppelin styles of music on plant growth. There were five trays of seeds each with twenty plants with each set given thirty minutes of music per day. It was believed that the plants with the acoustic Zeppelin would grow the best. The more hard rock and heavy beat music plants grew the best. In the future more time would be given to the growing period and extended music time would be added.

Project Number: MBI014

Grade: 7

Title: Artificial and Natural Light

Abstract: Plants were placed under two different light sources: artificial and natural light. Was artificial or natural light a more efficient way to administer plant growth? Research suggested that organisms under natural light grew larger, while organisms under artificial light did not grow as efficiently. Every day, for twelve days, plant growth was charted. Plants under natural light had higher growth averages. Future work is planned to see how plants grow under different light sources.

Project Number: MBI015

Grade: 8

Title: Mouth Temperature and PH Levels

Abstract: While brushing my teeth, I wondered when the best time of day would be to brush my teeth. During one school week, five students provided saliva samples three times each day. A total of 25 students were tested. Sample temperature and pH were tested and compared. My data showed that the lunch time samples had the highest pH and temperature which would be the best time of day to brush your teeth.

Project Number: MBI016

Grade: 8

Title: 4 - Leaf Clovers...Fact or fantasy?

Abstract: Last summer, I stumbled across several genuine four-leaf clovers. After extensive research, I discovered that the abnormalities such as the growth of extra leaves are caused by less than perfect environmental conditions. My experiment consists of thirty plants of the trifolium repens (white clover) genus grown indoors. The clovers were divided into three groups of ten being watered with distilled, salt, and chlorinated pool water. Gradually, all plants, excluding those watered with chlorinated water, developed yellow and brown spots, and all of their growth rates drastically decreased. I'm presently continuing my experiment; therefore, final results are yet to be obtained.

Project Number: MBI017

Grade: 7

Title: Got Growth

Abstract: The purpose of my project was to see if seeds would germinate if I put them in the microwave, fridge, freezer, or oven. My hypothesis is I think if I put groups of seeds in the fridge, freezer, microwave, or oven then the groups fridge and freezer will grow the most out of all. I put the seeds in the appliances and then planted them in the cups of soil. I learned not to put pepper seeds in the microwave and oven. The seeds put in the microwave and oven did not grow at all. My hypothesis was correct.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI018

Grade: 8

Title: The Effect of Nutritional supplement on the Rate of Fermentation

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI019

Grade: 8

Title: The Effect of Light on Worm Behavior

Abstract: My project is the effect of colored lights on worm behavior. What caused me to pick this topic was everytime my grandpa would go out at night and try to catch worms, he would come home with a small amount, because when he shown the light on the worms they would burrow themselves in the ground making it impossible for him to catch. The first thing I did was add soil and worms to each of the four containers. Next I kept the worms in seclusion for an hour. Finally I held a light over them for five minutes and recorded my data. The worms moved a lot to the white light and not at all to the green light. I feel my project will help every fisherman that catches his own worms because if they use a green light the worms will not run. My data matched my hypothesis.

Project Number: MBI020

Grade: 8

Title: Temperature and Seed Germination

Abstract: Growing seeds can be a lot of fun and sometimes very rewarding. This project was run to find the best temperatures for seed germination. Twenty pots were each filled with a seed and dirt and then exposed to different temperatures and monitored for germination. In the end, nothing sprouted at all. The seeds in the freezer became frozen, the seeds in the heater and refrigerator rotted, and the seeds that were room temperature dried out. Later studies will revolve around room temperature and heated soil testing, varying the amount of water given, planting the seeds more shallow, and closer monitoring of temperature changes.

Project Number: MBI021

Grade: 7

Title: What Beverages Weaken Bones?

Abstract: Do people drink too much of one drink? This project was conducted to see the impact of beverages on bones. Six different liquids with two samples each and one bone in each jar were out for one week. At the end of that week the bones were taken out and the degree of bend was measured. The Kool-Aid and soda pop bones were the only bones that bent.

Project Number: MBI022

Grade: 7

Title: How Dirty Is Your School?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI023

Grade: 8

Title: Are You Similar or Not?

Abstract: I decided to do this experiment because I like to watch people dust and identify fingerprints. If I fingerprinted related and non-related people would there be any similarities? The procedures that were used were the person put their name on the card, then rolled their fingers in the ink, rolled their fingers on the card in the space provided. I recorded the different types of fingerprints to see if there were any similarities between related and non-related people. My data

INTERMEDIATE DIVISION - BIOLOGY

showed no significant similarities in either group but the most common type of fingerprint were loops and arches.

Project Number: MBI024

Grade: 8

Title: The Effect of Yeast on Surrounding PH.

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI025

Grade: 7

Title: Lettuce Preserve You

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI026

Grade: 8

Title: Nitrate Absorbant in a Marine Aquarium

Abstract: Recently, ammonium nitrates are polluting streams, rivers, and even oceans! Ammonium nitrates can cause the nitrate level in oceans to become toxic. The marine fish, corals, and invertebrates are very delicate and can die from high levels of nitrate. In this experiment, I am testing to see what saltwater plant will absorb nitrate the fastest. Between the two plants tested, saltwater caulerpa and saltwater halimeda, the saltwater caulerpa absorbed the nitrates the fastest. As you can see, the saltwater caulerpa would be a great choice to plant in oceans to help absorb nitrates so they won't become too toxic.

Project Number: MBI027

Grade: 8

Title: Effects of Grass on Flowers

Abstract: Flowers are grown every summer and a space in the yard is cleared of grass and weeds for them. This investigation intended to learn if grass being grown around flowers affects the growth of the flowers. Three different kinds of flowers were grown with and without grass around them. I watered them three times a week on a schedule. The flowers grown without grass around them grew higher and faster than the flowers grown with grass around them. Future work is planned to determine if more time would have produced different results.

Project Number: MBI028

Grade: 8

Title: Color My World

Abstract: Does different colored ink effect memory retention? My hypothesis is that the color will effect a person's memory retention because it takes time for the eyes to adjust to different colors. I used 8 subjects; 4 boys and 4 girls. I tested them using simple words in different colors. Each test had 9 words in 3 columns and 3 rows. I gave each person 15 seconds to study the words. Then I gave them 30 seconds to write down as many words they could remember. They also had to put the words in the correct column and row. When they finished, I checked to see how many words each person got right. After calculating the results, I found that people remembered the most words on the blue ink test. Blue ink averaged 4.75 word correct, green and red averaged 4.25 words correct and yellow averaged 4.125 words correct.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI029

Grade: 7

Title: From Roots to Shoots

Abstract: This science project was done on geotropism, or the effect of gravity on plants. This work focused on proving that when a seed's hilum is planted upside down the shoots will grow downward, hit the bottom of the fish tank that it is planted in and eventually turn and grow upwards. This work also focused on proving that the roots grew downward as expected. After careful observation the results display shoots growing down and up and the roots growing downward

Project Number: MBI030

Grade: 7

Title: Grass in Different Environments

Abstract: People strive to have the best lawn in their neighborhood. This experiment was intended to learn if different environments affect the growth of grass. Four different environments were replicated and grass was planted in each container. Root mass was measured after a period of 20 days. It was determined that the swampy environment proved to have the most root mass. Further studies could include the addition of more environments.

Project Number: MBI031

Grade: 8

Title: The Effect of Vioxx on Daphnia

Abstract: The purpose of my project is to see if Vioxx really causes heart malfunctions. I became interested because someone I know suffered a heart attack while taking the medication. First I took the Daphnia and separated them into five containers. Different amounts of water was added to the container. The heart rate was recorded. The results of my project were that the increased concentrations of Vioxx caused a higher heart rates. The container with more water had a lower heart rate. Anyone taking this medication can benefit from my results.

Project Number: MBI032

Grade: 7

Title: Remember: Gender Counts

Abstract: Does gender effect your short term memory? To do my experiment, I needed some materials: paper, pencils, different letters and numbers, glue, a 56cm x 37cm piece of poster board, 4 people(2 men and 2 women). To conduct this experiment I glued the numbers and letters to the poster board. I then showed the subjects the board and gave them 30 seconds to study the sets of letters and numbers. They where then given 30 seconds to write down what they remembered. each was tested several times. My data shows that women remember a steady amount more than men do on short-term basis.

Project Number: MBI033

Grade: 8

Title: Oxygen Damagaing Radicals

Abstract: Many questions are posed to doctors and medical researchers regarding the topic of ageing. My idea was to find a systematic way to determine if free oxygen damaging radicals accelerates the ageing process. I used fruit flies when conducting my experiment. There were four groups in the study. 100% water, 99% water and 1% Hydrogen Peroxide, 98% water and 2% Hydrogen Peroxide and a 97% water and 3 % Hydrogen Peroxide. I watched and observed movement and habits. Previous experiments have found they do indeed accelerate the ageing process.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI034

Grade: 7

Title: Soil verses Newspaper

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI035

Grade: 7

Title: Can You Influence Plant Growth?

Abstract: Can talking to plants influence their growth? I will divide the plants into three groups: A,B,and C. The plants will be placed into 3 aquarium type environments. Group A will be exposed to additional carbon dioxide gas. Group B will be talked to at close range. (This will also expose the plants to additional carbon dioxide gas, but it will be less than group A. Group C will be the control group and will not receive additional carbon dioxide gas, only carbon dioxide that is in the air. The plants will be observed and measured. The data will be recorded and compared.

Project Number: MBI036

Grade: 7

Title: 'Egg" Citing Osmosis

Abstract: The purpose of this experiment was to determine the effects different concentrations of brown corn syrup has on the movement of water across a membrane. Eggs with dissolved shells were used to similate living cells. These eggs were submerged in 100%, 50%, and 25% solutions of corn syrup. The control was distilled water. The shell-less eggs were submerged in the solutions for 15 minute intervals for 120 minutes. At each 15 minute interval, the eggs were taken from the solutions, rinsed, dried and weighed. The results were all the eggs in the corn syrup solutions lost weight, the eggs in the 100% lost the most weight. The eggs in the control are the only eggs that gained a small amount of weight. weight.

Project Number: MBI037

Grade: 8

Title: What's for Dinner?

Abstract: My purpose was to compare foods from fast food restaurants and find out which were the healthiest.

Project Number: MBI038

Grade: 8

Title: Effects of Sweeteners on Bacteria

Abstract: Artificial sweeteners are made of dextrose, aspartame, saccharin, and sucralose. The purpose of this project is to determine if name brand sweeteners affect bacterial growth. To test the effects of the sweeteners, I used two bacteria, E. coli and B. subtilis. The sweeteners used were Equal, Splenda, Sweet n'Low, Domino, Splenda, Raw Sugar, and a control. Each sweetener was mixed with agar and poured into petri dishes, 8 plates for each sweetener. E.coli was swabbed on four petri plates for each sweetener, and B.subtilis was swabbed on four. All the petri plates were incubated at 37 degrees C for 24 and 48 hrs. The plates were observed after 24 and 48 hrs. After 48 hours, the results were compared. The results were from the most growth to least: Equal, Sweet n'Low, Domino, Splenda, Raw Sugar, and the control that had no sweetener added to the agar.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI039

Grade: 8

Title: The Effect of pH on Mold Growth

Abstract: Bread mold is an unwelcome thing in any kitchen. This project studied the effect pH had on mold growth. Liquids with different pH values were evenly spread onto pieces of bread. They were then placed into plastic bags. The number of mold spores that appeared on the bread was recorded daily. It was discovered that bread with an environment of pH 4, orange juice, produced the most mold. No other pH was a significant opponent. The results may have to do with the fact that orange juice contains sugar. Future work may include the effect sugar has on mold growth.

Project Number: MBI040

Grade: 9

Title: Accuracy of DNA Identity Testing In Different Human Tissues

Abstract: In this project, I tested the accuracy of various human tissues and samples in identity testing. I compared 4 human tissues, buccal swab, fingernail, hair sample, and licked envelope. I compared these results to show which sample yields the most and the highest quality DNA.

Project Number: MBI041

Grade: 7

Title: pH Preference of Plants

Abstract: What pH of water is best for plants? I chose this project because I wanted to know if acidic or basic water was better than neutral. My hypothesis was that the neutral water would produce the best results because it is pure. I did this experiment by adding substances to water to make it acid or basic and some were neutral for a control. I then watered different plants with the different pH of water and recorded their height each day. I observed that neutral water made the plants grow the best. In conclusion my hypothesis was proven correct.

Project Number: MBI042

Grade: 7

Title: Dryer Lint : Trash or Treasure?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI043

Grade: 7

Title: Regeneration and Caffeine

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI044

Grade: 8

Title: The Effect of Different types of Water of the Growth of Mung Bean Seeds

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MBI045

Grade: 8

Title: How Do Different Soils Affect the Growth of Radish Plants?

Abstract: Do different soils really affect the way that a plant grows? This work intended to determine how different types of soils affect the growth of radish seeds. Four different soil types were collected in Westmoreland County and radish seeds were grown in them for a period of

INTERMEDIATE DIVISION - BIOLOGY

twenty-four days. On the harvest day of my plants, I pulled them out of the soil to observe and measure stem length and leaf width. It was determined that that the radish seeds grown in the Monongahela series soil type grew the best. Future work is planned to test other soil samples in a neighboring county.

Project Number: MBI046

Grade: 8

Title: Enzyme Concentration vs Activity

Abstract: Enzymes, protein molecules, are catalysts that affect the rate of a reaction without being changed or used up itself. The performance of an enzyme is dependant upon four physical factors. They are temperature, pH, the amount of the enzyme, and the amount of the substrate. Amylase, an enzyme found in saliva, changes starch into sugar. What concentration of amylase will effectively reduce a given amount of starch to sugar?

Project Number: MBI047

Grade: 7

Title: Testing Vitamin C in Guinea Pig Feed

Abstract: I have noticed the lifespans of cavy (guinea pigs) I sell vary dramatically among different homes. Literature suggests that vitamin C deficiency may play a vital role. I set up a research program to test if store bought feeds met the suggested vitamin C quantities. I tested 6 feeds and two of the name brand feeds had virtually no vitamin C while the others had lots of vitamin C. Reformulating these feeds and making sure they had enough vitamin C could save thousands of cavy lives.

Project Number: MBI048

Grade: 8

Title: Gibberellin : A Growth Hormone

Abstract: The purpose of the experiment was to see if applying the growth hormone gibberellic acid to mustard plants would make them grow taller. To half of the plants, I applied one drop of gibberellic acid to each leaf every other day for 40 days. The other plants were treated with water. There were two types of plants: wild-type and rosette. The rosette-type, naturally dwarf plants, were greatly affected by the growth hormone and grew significantly taller.

Project Number: MBI049

Grade: 8

Title: Icy - -Hot Limas!

Abstract: My project was to find the solution to the question "does extreme temperature affect plant growth/germination?" I wanted to see if seeds kept in the freezer, refrigerator, by the heater, and at room temperature varied in growth. At the end I found that there in fact is a negative affect on plant growth in extreme temperatures. The heated seeds were affected most because strangely, they grew upside down with their roots in the air. The cold seeds didn't grow very high and as expected the control grew normally.

Project Number: MBI050

Grade: 8

Title: Elodea - The Oxygen Producer

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION - BIOLOGY

Project Number: MBI051

Grade: 8

Title: The Effect Of Alcohol On Daphnia

Abstract: I did this experiment to help people with drinking problems. i hope they will see the effects of alcohol on their body, and stop drinking it. For my procedure, I put one Daphnia under the microscope. I then put the Daphnia in different types of alcohol, and counted their heart rate for a minute. The results are as follows from least to greatest: Sam Adam's Light, Glades Pike Reisling White Wine, Paul Masson Burgundy Wine, Sam Adam's Beer, and Jacquin's Rum. In conclusion, my hypothesis was correct. However, the results varied because the Daphnia were not all exactly alike. Also the temperatures of the alcohols were impossible to make exactly the same.

Project Number: MBI052

Grade: 8

Title: Nitrogen Content in Soil and Plants

Abstract: When my grandmother would work in her garden she would always add a nitrogen fertilizer into the soil and I always wondered why she did this. When I did my experiment I planted mung bean seeds in vermiculite with different levels of nitrogen fertilizer. Then I took measurement of the color of the stems and leaves, the height, and area of the leaves and stems. When I finished my experiment I found that the plants with high levels of nitrogen did not grow and the low levels of nitrogen poorly grew.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH001

Grade: 7

Title: Which substance keeps flowers fresh longer?

Abstract: My experiment was to see which substance will keep flowers fresh the longest. I tested bleach, aspirin, a penny, Listerine, and sugar. I hypothesized that if aspirin helps blood flow better, then aspirin may help water flow through a flower's stem, thus helping it live longer. I used bunches of mums that I could cut individual flowers from. I placed each one in a vase then measured the angle for 12 days. My hypothesis was proven wrong the sugar worked the best. The sugar stayed fresh for 11.4 days. The aspirin came in last with 4.5 days.

Project Number: MCH002

Grade: 7

Title: The Chromatography of Purple Marker Pigments

Abstract: The purpose of this project was to find out which marker had the greatest amount of blue ink. I hypothesized that if I performed chromatography, the method in which is used to separate and/or to analyze complex mixtures, on each of the four chosen purple markers, Crayola, Colorific, RoseArt, and Noris Club, then the RoseArt would have the largest portion of blue among the others. After using this method the results actually showed that the Noris Club marker had the most blue ink on the contrary of what I originally thought would. These outcomes did not agree with my hypothesis.

Project Number: MCH003

Grade: 8

Title: Coal Mining and Streams

Abstract: The purpose of my project was to test and find out if streams above longwall coal mines were more polluted than those that aren't above longwall coal mines. After collecting samples at streams and completing a 3 page research paper, I tested the water samples using 2 water test kits. The end results clearly showed the streams that were mined under were more polluted.

Project Number: MCH004

Grade: 7

Title: A Bright Idea

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCH005

Grade: 8

Title: What Is The Best Deicer To Use On Ice?

Abstract: The purpose of my experiment is to find the best deicer. I put an even amount of water in each pan by filling the pans up to a 2.5 cm mark. Calcium chloride, sodium chloride, fertilizer, sand and cat litter were the variables tested on the ice. My data shows that the best deicer is the calcium chloride, second was the sodium chloride, third was sand, fourth the control, fifth was the fertilizer and the worst deicer was the cat litter. Anyone with an icy situation can benefit from my results.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH006

Grade: 7

Title: Amount of Carbonation

Abstract: My experiment was to see which soda has the most carbonation at different temperatures. I purchased three different kinds of soda and placed them at different temperatures. Mentos were added to each bottle and the height of spray was recorded. After I did that, it was clear that Diet RC (381cm spray) was the soda that had the most carbonation and the second highest one was Diet Coke with a height of 223.52 cm.

Project Number: MCH007

Grade: 7

Title: Extraction of Caffeine from Tea Leaves

Abstract: Caffeine is a substance that stimulates production of adrenaline. It is found in tea, coffee, and soft drinks. This experiment was intended to learn about which type of water (hard or soft) could affect the amount of caffeine extracted from tea leaves. Both types of water were tested with a laboratory procedure to isolate and measure the amount of caffeine extracted. Results show that the amount of isolated caffeine from soft water was greater than caffeine from the soft water samples.

Project Number: MCH008

Grade: 8

Title: Effect of Mouthwash on Bacterial Growth

Abstract: Bacteria can be found almost anywhere. Everywhere you go there is going to be bacteria. In order to conduct this investigation; it required me to see which mouthwash out of the Anti Plaque, Mint and Spiral mouthwashes, that which one worked the best on killing bacterial growth. In order to conduct this investigation also I was required to put bacteria on petri dishes for 3 days at 37 degrees Celsius. Then I had to put the mouthwash on the labeled petri dishes for 24 hours. Then do this again and analyze results and record data with graphs and charts.

Project Number: MCH009

Grade: 7

Title: Evaporation of H₂O

Abstract: The purpose of my project was to determine whether different substances in water would cause it to evaporate faster. If I add salt and no food coloring to water, then it will evaporate faster. I put water with food coloring and ingredients in cups to see which would evaporate faster. The water with salt and blue food coloring evaporated the fastest, while the water with red food coloring and salt evaporated the slowest. My data disagreed with my hypothesis. In conclusion, I learned that the waters with vegeta in them, started to get too old and form fuzz.

Project Number: MCH010

Grade: 8

Title: Which Liquid Cleans Pennies The Best?

Abstract: Pennies are one of the things that we touch every single day. This work intended to learn which liquid would clean a penny the best. Four different liquids were set out with one penny in each container. It was determined that white vinegar was the best liquid to clean pennies. Literature suggests that the longer you soak your pennies, the cleaner they will become. Future work is planned to test the pH of the liquids used to determine a relationship between the pH of the solution and its cleaning abilities.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH011

Grade: 8

Title: Bio-rusting; "M-I-C" is the "K-E-Y"

Abstract: Abstract was not submitted electronically.

Project Number: MCH012

Grade: 8

Title: Black and White Negative Density

Abstract: Abstract was not submitted electronically. I decided to learn if the temperature of the developer affects the density of black and white negatives. In the experiment, I changed the temperature of the developer or D-76 from five degrees Celsius to 30 degrees Celsius, going up by five degrees. The 30 degree Celsius negatives had the highest density than any other temperature negatives, and 10 degree Celsius was the thinnest negative, meaning it didn't have much density. I concluded that the warmer the temperature gets, the more dense the negative becomes; the colder the temperature gets, the less dense the negative becomes.

Project Number: MCH013

Grade: 7

Title: Light Effect on Photosynthesis

Abstract: In aquatic plants, photosynthesis is where the plant takes up carbon dioxide dissolved in water and releases oxygen. The pH change occurs during photosynthesis because the plant uses up this carbon dioxide. The purpose of this experiment was to determine if the rate of photosynthesis would change with more light. Anacharis plants in water received different amounts of light. Photosynthesis was indirectly measured from the change of pH in the water. The data from the experiment agreed with my hypothesis that the rate of change of pH was directly proportional to the amount of light the plant received.

Project Number: MCH014

Grade: 7

Title: Stains, Stains Go Away

Abstract: I wanted to take coffee stains out of fabric. For my problem statement I wanted to find out what household or natural product removes stains the best. I stained all socks with coffee and then tried to remove it with different natural and household products. In conclusion, I have found out that bleach is the best product to remove stains. I found that the best natural product that I used was saltwater. I also have found bleach to be the best household product.

Project Number: MCH015

Grade: 7

Title: Scum No More

Abstract: Soap scum is an unwelcome visitor to showers and bathtubs. This work was intended to find out which foam tile cleaner removes soap scum the best. Ceramic tiles were coated with soap scum. Different brands of foam tile cleaners were sprayed and the amount of soap scum that was removed was massed and recorded. The Great Value brand removed the most soap scum. I am glad that I got into this project and I hope some peoples' decisions were influenced to use this foam tile cleaner.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH016

Grade: 8

Title: Comparing Freezing Points

Abstract: This investigation was performed to see if a salt solution or a sugar solution would freeze faster. Three salt and three sugar solutions were placed in the freezer. They were timed until the solutions were frozen. To determine the frozen state, the cups were tilted. If there was any movement of the liquid, the solution was not frozen. The results showed that the salt solution took longer to freeze than the sugar solution. In conclusion, it was shown that a salt solution has a lower freezing point.

Project Number: MCH017

Grade: 8

Title: Synthesis Of Aspirin

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCH018

Grade: 8

Title: Shocking Fruit!

Abstract: Which fruits of the chosen puts out the most voltage? I hypothesized that the lemon would have the most power, followed by the lime, then the orange, and finally the kiwi. My hypothesis was incorrect. The kiwi had the most power with an average of 7 volts, then the lime came in with 4 volts average, after that the lemon came in with 3 volts, and lastly the orange came in with 2 1/2 volts. My research led me to believe that the lemon would have the most power because it is the most acidic, but for some reason the kiwi gave out the most energy. The reason could be that the kiwi has more vitamin C than the lemon. I overlooked that fact. First connect 3 fruits together with zinc and copper terminals with copper wire and alligator clips. Push one copper penny into the flesh of one type of fruit and one zinc strip in the flesh of the same fruit. Do the same for the other two halves of the same fruit. Connect the wire coming from the copper penny to the positive terminal of the Multimeter and the wire coming from the zinc strip to the negative terminal of the Multimeter. Repeat the previous steps for each type of fruit for three trials each. Record and compare data.

Project Number: MCH019

Grade: 7

Title: Antacids: Neutralizing Gastric Juice

Abstract: The stomach's mucosa lining produces gastric juice containing hydrochloric acid, which has a pH of 2. If the sphincter between our stomach and our esophagus fails to close during digestion, the gastric juice can enter the esophagus and cause the burning sensation known as heartburn or GERD (gastroesophageal reflux disease). Ten antacids were tested in gastric juice using a pH meter in three trials to see which one neutralized the gastric juice the fastest. Results showed Rolaid's Multi-Symptom and Rolaid's Extra Strength were the fastest acting antacids. Analysis of all active ingredients showed that Rolaid's is the only brand that contains two antacids. Rolaid's M. S. costs twice as much as Rolaid's E.S. due to the addition of simethicone.

Project Number: MCH020

Grade: 8

Title: Does AMD Affect the Monroeville Area?

Abstract: Coal is a cheap and abundant source of energy found in southwestern Pennsylvania. Coal was and is still being extracted from deep underground mines in the area. Unfortunately, water in old abandoned coalmines can seep out and join the local streams and rivers causing Acid Mine Drainage (AMD). This work intended to learn if AMD was affecting streams in the

INTERMEDIATE DIVISION - CHEMISTRY

Monroeville area. Several water seeps and streams were sampled throughout the Monroeville area; pH, Conductivity, and flow data were recorded. AMD was found to be present in the watershed that comprises the Monroeville area.

Project Number: MCH021

Grade: 7

Title: Which Liquids are Conductive?

Abstract: The experiment's purpose is to understand the nature of the conductivity of liquids. This knowledge can be used to develop environmentally friendly batteries. Scientists can, perhaps, develop a natural electrolyte for the batteries. The experimental procedure includes measuring the electric current through "natural products" such as different juices and beverages as well as through artificially prepared aqueous solutions of some salts and organic acids. It was found that liquids that contain ions, such as juices, aqueous organic acids, and salts, conduct electricity. Others did not. It was concluded that the conductivity of a liquid depends on the amount of ions it contains.

Project Number: MCH022

Grade: 7

Title: Glue Strength: Strong or Weak

Abstract: I wanted to know which glue is the strongest because my family doesn't want to buy glue that won't hold a lot of weight. Elmer's, Ross's, and homemade glue were tested. The homemade glue was made from dry milk, water, baking soda, and vinegar. I tested how strong they were by determining how many washers they held on a Popsicle stick attached with each type of glue. In the end, my hypothesis was proven incorrect: Elmer's glue was the strongest, not homemade.

Project Number: MCH023

Grade: 7

Title: Convection Currents

Abstract: Convection currents are a very common thing in everyday life. This project was planned to prove that convection currents are real and can be shown in a model. A model of convection currents were set under evenly spaced cups, and were observed. This project was done because the topic was interesting and fun. The results proved the hypothesis correct: convection currents can be seen in a model. I learned that convection currents can be used for many things in life, for everyday purposes. Future work is planned to determine that convection currents can be seen in many more things.

Project Number: MCH024

Grade: 8

Title: Apples Dark, Apples Light; Which pH Makes Them Right

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCH025

Grade: 8

Title: Vitamin C Felicity

Abstract: The purpose of the experiment was to determine if temperature affects the amount of ascorbic acid that remains in different kinds of fruit juices. Apple juice, orange juice, and lemonade were tested in different temperatures for their ability to retain vitamin C over time. Iodine titrations were used to measure the quantity of vitamin C. Colder temperatures were associated with high vitamin C retention. Lemonade retained vitamin C the best over time.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH026

Grade: 8

Title: A Study of Rubberized Asphalt Cold Patch

Abstract: Asphalt Rubber is produced through a commercial process whereby liquid asphalt binder and crumb rubber are heated and mixed in a chemically reactive process. The result is a more flexible, durable paving material that lasts many years longer than conventional asphalt. A consumer repairing an asphalt driveway cannot duplicate this commercial process at home, but would still like to have the same benefit. The purpose of this project is to determine if recycled tires can be added to asphalt cold patch and produce a product with greater strength and flexibility. Asphalt cold patch samples will be prepared with various amounts and shapes of recycled rubber tire pieces. These samples will be tested at room temperature for strength and flexibility using a shear test, bounce test, imprint test and an adhesion test. A second phase will be conducted following the same procedure. In these trials the samples will be tested at freezing and at higher temperatures to determine how the cold patch samples perform at high and low temperatures. The data collected from the performance tests will be recorded, charted and analyzed. The results of this study will determine if the addition of recycled tires to asphalt cold patch will give homeowners a more durable and long lasting product for the repair of asphalt driveways

Project Number: MCH027

Grade: 8

Title: Rubber or Plastic?

Abstract: The purpose of the experiment was to find out whether rubber or plastic is stronger under extreme conditions. Test samples of rubber and plastic were exposed to high heat and extreme cold temperatures and then measured for their tensile strength. I found that the plastic was stronger than the rubber sample.

Project Number: MCH028

Grade: 8

Title: Fuels for Pennsylvania Future

Abstract: Coal is one of the largest natural energy sources used in the U.S. This project was intended to find a better alternative to coal for energy purposes. Six different fuels were tested, along with bituminous coal as a reference point. An alternative is determined by finding the heat value of each fuel. It was determined that ethanol is the best alternative to coal. However coal was the fuel highest heat value. These findings are vital because research has shown that the coal supplies in the U.S. are being depleted at an alarming rate.

Project Number: MCH029

Grade: 7

Title: Vitamin Plants

Abstract: My project is about if vitamin enhance plant growth and/or apperance.

Project Number: MCH030

Grade: 8

Title: How Do You Spell Relief

Abstract: Many people suffer from stomach problems. This experiment was done to see if cabbage water could accurately test the acidity of certain foods and also to see which antacid neutralizes the acids best. Five foods were tested with the cabbage water. The acids were then tested for pH using litmus and pH paper. The cabbage water was accurate and the Tums antacid was the best neutralizer. Other tests could be done using long-term medications instead of antacids.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH031

Grade: 8

Title: Water Resistant Sunscreens

Abstract: At some time or another, many of us have been sunburned while at a beach or a pool. Since I used to be a swimmer, I felt inclined to research which brand of waterproof sunscreen is the most effective in blocking ultra violet light after its exposure to water. Neutrogena, Coppertone, and Banana Boat SPF 30 sunscreens were compared. My original hypothesis was that Coppertone would work the best, but Neutrogena was the most effective in blocking UV after exposure to water. I hope to one day determine if different SPF's of sunscreen make a difference in its water resistance.

Project Number: MCH032

Grade: 7

Title: Which Detergent Works the Best?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCH033

Grade: 7

Title: Candle Burn Rate & Hardener Amounts

Abstract: I made candles using paraffin wax and different amounts of different hardeners to see if adding more hardener to wax would make a candle burn longer. My control was paraffin wax with nothing added. I then added increasing amounts of five types of wax hardener to wax. I burned the candles for fifteen minutes and recorded which hardener and which amount of hardener burned the longest. I learned that all of the hardeners made the candles burn longer if more was added. However, if too much hardener was added the candles did not burn at all.

Project Number: MCH034

Grade: 7

Title: Lactaid's affects on different milks

Abstract: I wanted to find out if different types of milk will increase Lactaid's performance. I dissolved half a Lactaid pill, put it in 50 ml's of milk, and tested it with glucose test strips. I found that the whole milk and the two percent had an average of 100 mg. of glucose; the one percent milk had an average of 130 mg. of glucose. The skim milk and ultra skim milk had an average of 250 mg. of glucose. Skim and ultra skim milk performed the best. So if one takes Lactaid they should drink skim or ultra skim milk.

Project Number: MCH035

Grade: 8

Title: Materials & Sandbags & Water

Abstract: Floods are devastating events that destroy many properties and homes every year. In September, a flood devastated our town. Sandbags are one of the few options to help keep water in or out. Sandbags can even decide if houses get flooded or not. Because of the importance, it was a question what material would work the best by absorbing the most grams of water. This experiment was designed to test the different materials. Diaper stuffing will absorb the most water. Future research would include ways to use the stuffing with sand.

INTERMEDIATE DIVISION - CHEMISTRY

Project Number: MCH036

Grade: 8

Title: Flame Propagation Rates

Abstract: Fire prevention is an important part of today's society. This project will show which common materials found in a household are the most flammable. Each material was set on fire in 20 and 0 degrees C environments. The time it took to catch on fire, have the fire propagate, and have it burn out completely was recorded. Newspaper had the lowest propagation time and carpeting the highest. Mattress stuffing had a quick propagation time but a long combustion time, making it dangerous. Future plans include testing more materials in different temperatures.

Project Number: MCH037

Grade: 8

Title: Super Absorbent Polymers

Abstract: Super Absorbent Polymers are used in many different places. The most common uses for them are in baby diapers, although there are a variety of other uses for them, such as in water conservation in landscaping or gardening, wheelchair pads, instant hot/cold packs, reusable hot/cold packs, and fire protection. I tested 4 different polymers from ETI and BASF to see which would absorb the most liquid. My results showed that one polymer from each company (ETI and BASF) tied in absorbing power.

Project Number: MCH038

Grade: 7

Title: Effect of Var. Cmpds. on Mlt. of Ice

Abstract: In my project I took different types of ice melting compounds and figured out which type of ice melter would melt ice the quickest. In my project, I took different ice melters and poured them evenly over an equal amount of ice and recorded melting times. The reason I chose this project is that one day last winter my dad and I were in a hardware store looking at the different types of ice melters. My results show that the calcium chloride had the lowest total melting time of all of the compounds used.

Project Number: MCH039

Grade: 8

Title: What is the Effect of Candle Flames On Baby Clothing?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCH040

Grade: 7

Title: Egg - speriment

Abstract: The purpose of this experiment was to see which kind of toothpaste would keep an eggshell hard while submerged in vinegar. When I was 5 years old I had several cavities. The problem was lack of fluoride. Ever since I have been taking fluoride vitamins. I've also wondered which kind of toothpaste would work the best to keep the enamel of the tooth the hardest.

Project Number: MCH041

Grade: 8

Title: Hot dogs and SPF

Abstract: This project was intended to find out which SPF is safe to use on your skin. The four SPFs used were 8, 15, 30, and 50. Sunscreen were spread on hot dogs and the time it took for the hot dogs to burn was recorded. It was determined that an SPF of 30 is a safe SPF to use up

INTERMEDIATE DIVISION - CHEMISTRY

to 45 minutes. An SPF of 50 works for more than an hour. If this project were to be repeated I would use different brands of sunscreen.

Project Number: MCH042

Grade: 8

Title: Get It Off!

Abstract: The purpose of the experiment was to examine the first step taken in the recycling process of aluminum cans. The first step involves removing the paint from the can. The procedure tested the ability of different solvents in successfully removing paint from the can. Acetone was found to be the best solvent for removal of paint. The experiment would benefit chemists and recycling companies who wish reduce human waste.

Project Number: MCH043

Grade: 7

Title: Analysis: Vit. C Content – Is Organic Better?

Abstract: Is organic food healthier than conventional food? The problem in this experiment is which orange juice will contain the greatest amount of Vitamin C – organic or conventional? It was hypothesized that fresh squeezed organic would contain the greatest amount of Vitamin C when first tested, and fresh squeezed conventional would contain the greatest amount of Vitamin C after 2 weeks. Following the procedure from AOAC Official Methods of Analysis, 54 titrations using indophenol measured the vitamin C content of fresh squeezed, frozen, and orange juices in a carton. The hypothesis was supported by the data.

Project Number: MCH044

Grade: 8

Title: A Sweet Treat For Yeast

Abstract: Yeast thrives on sugar and artificial sweeteners. This experiment was done to discover which sweetener, when mixed with yeast and water, would cause the greatest chemical reaction. Warm water and bakers yeast was placed in five separate soda bottles. Then a different sweetener was placed in each bottle. Balloons, placed on top of the bottles, were measured and observed to find out how much carbon dioxide had been created. The balloon placed on the bottle containing powdered sugar became the largest. It was determined that powdered sugar created the largest chemical reaction when compared to the other four sweeteners.

Project Number: MCH045

Grade: 8

Title: Acid Content of Different Sodas

Abstract: The purpose of this experiment was to determine which type of soda, clear or dark, contains the most acid. This may be a concern for everyday consumers, specifically, consumers with acid reflex disease or ulcers. Different soda were titrated with a weak Sodium Hydroxide solution. A pH meter determined the pH of the soda during the titration. Data was collected and graphed and the endpoint of the titration was determined. Moles of acid were then calculated and compared for each soda. It has been concluded that the clear sodas contain less acid and may be more desirable by some consumers.

Project Number: MCH046

Grade: 7

Title: Iron in River and Well Waters

Abstract: The purpose of this investigation is to determine if well water contains more iron than river water because it comes out of the ground and picks up more minerals. Ten well water and ten river water samples were taken and tested for iron. The results of the testing showed that

INTERMEDIATE DIVISION - CHEMISTRY

river water from these samples had a higher average amount of iron in it. The well water contained higher amounts of iron in more samples than the river water, but the one river water sample contained the highest amount of iron and distorted the averages. Well water does not contain more iron than river water in all cases.

Project Number: MCH047

Grade: 8

Title: The Eff. of Household Chem. on F.P. of H₂O

Abstract: Water freezes during wintertime, and affects human lives, often in a bad way. This experiment was to deduce the change in the freezing point of water when five household chemicals (salt, sugar, vinegar, vegetable oil, and automobile antifreeze) were added. These chemicals were added in equal amounts to five identical beakers of water and one beaker of pure water served as control. The temperatures of each beaker were recorded hourly. The results indicate the salt made the most difference. Further research might be to determine how these five chemicals might affect the boiling point of water.

INTERMEDIATE DIVISION – COMPUTER SCIENCE/MATH

Project Number: MCM001

Grade: 7

Title: Patterns In The Mandelbrot Set

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCM002

Grade: 7

Title: Computer Viruses Attacked

Abstract: Computer viruses are a well-known problem today. It has been reported that the survival time of an unprotected computer on the Internet is 20 minutes or less. This experiment is designed to show how fast a computer will become infected without virus protection and software updates. A virtual machine will be used, which is a "computer within a computer." After 20-minute periods, the virtual machine will be checked for viruses. The prediction for this experiment is that the survival time of an unprotected computer is longer than 20 minutes.

Project Number: MCM003

Grade: 7

Title: The Perfect Shuffle

Abstract: Randomness in card shuffling is a highly debatable issue that has been researched in many thesis projects. This project was intended to show how many shuffles it takes to achieve the highest level of random distribution within a deck. A deck of cards was shuffled 100 times and recorded in Microsoft Excel, having 10 shuffles per spreadsheet. Shuffles were scored and each shuffle with the highest point total was recorded. Data was analyzed and averaged. My data demonstrated that five shuffles had the highest level of random distribution.

Project Number: MCM004

Grade: 8

Title: Computer Compression Libraries

Abstract: Data compression is an important utility for the computer age. A computer compression library is simply a collection of tools that deals with compressing or condensing information. This work is intended to study if some computer compression libraries perform better than others. Programs were created to test freely available compression libraries and to measure and record the compression time, decompression time, and compression ratio. It was found that amongst the libraries used, some did perform better than others. Impending work is planned to test larger files and to work on the timing element of the study!

Project Number: MCM005

Grade: 8

Title: The Effect of Card Quant. on Blkjack Wins

Abstract: Blackjack or 21 is a card game where everyone playing is trying to beat the dealer by getting the highest set of cards without exceeding 21. This work intends to discover what strategy works best to win the game of blackjack. It was determined that, in this experiment, the best strategy was to play the base two cards, along with one-drawn card. Future work for this project is planned to include draw-and-hold guidelines for more complex strategies, which is more like the most experienced blackjack players use to successfully play the game.

INTERMEDIATE DIVISION – COMPUTER SCIENCE/MATH

Project Number: MCM006

Grade: 8

Title: Building a Musical Oracle

Abstract: I created mp3 analysis software/feature extractor to quantitatively characterize songs for classification and a neural network for processing the features extracted by my feature extractor. I selected 50 songs from each genre of music for training the neural network and found them at walmart.com (hits) and vh1.com (non-hits). The performance of the neural network was then evaluated on another database of 50 songs that had a random mix of "hits" and "non-hits". I experimented with various configurations of the neural network to try and improve the predictive performance of the software. I managed to get reasonably high accuracy rates.

Project Number: MCM007

Grade: 7

Title: But How About the Real World/

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS001

Grade: 8

Title: What's the best Battery for the job?

Abstract: The purpose of my experiment was to find out which type of battery would provide power for the longest period of time. I chose this topic because I wanted to know what type of battery was the most efficient to use. My problem was: "Which battery can run this motor the longest time before running out of energy?" My hypothesis was that lithium-polymer batteries would last twice as long as nickel-cadmium (ni-cad) batteries and about as long as dry cells. Lithium-polymer and ni-cad batteries both had rated capacities of 700 mAh (milliamps per hour), while the dry cells had a rated capacity of 1120 mAh.

Project Number: MCS002

Grade: 7

Title: Best Tasting Milk

Abstract: At my school 1% milk is not a choice to buy at lunch. This experiment wanted to see if students could tell the difference in taste of different milks in a blind study. Students received parent permission to take part in this experiment. 1% milk was selected as the best tasting milk as often as was regular milk. In the future I hope to present the findings of the experiment to the school administration and maybe 1% will be added to the selection of milks at my school.

Project Number: MCS003

Grade: 8

Title: Cushion Your Noggin

Abstract: Hockey is growing in popularity along with the injuries that come with it. The purpose of my experiments was to see which type and density of foam could best protect your head when hit with a hockey puck. Three different types of foams were tested. Two tests were run: a test with Plexiglas (resembles the shell of the helmet) and one without Plexiglas. When the puck was flung by the sling shot, in the end, the high density foam best protected the egg and left little damage. This could definitely help all helmet inventors, not just hockey, in the future by using foam with a high enough density to protect your head without making it uncomfortable.

Project Number: MCS004

Grade: 7

Title: Do Whitening Toothpastes Work?

Abstract: Do whitening toothpastes really work or is the public being misled? If they do really work, which one works best, and why? The hypothesis was that toothpastes containing hydrogen peroxide would whiten the most. The toothpastes tested in this experiment were: Aim, Ultrabrite, Pepsodent, Opalescence, Close-Up, Advance White, Crest Whitening, Colgate, Rembrandt Plus, and Aquafresh Whitening. Results showed that Aim, Ultrabrite, and Opalescence did the best at whitening the teeth. Further research of whitening agents showed that hydrogen peroxide bleaching requires one hour per day for 14 days. However, this is not practical because we do not brush our teeth for one hour each day. This led to the conclusion that the abrasives contained in the toothpastes are the agents responsible for whitening the teeth.

Project Number: MCS005

Grade: 7

Title: Does Insulation Limit Heat Loss?

Abstract: My hypothesis is that R-6 fiberglass batt insulation will limit heat loss better than R-3 extruded polystyrene. To test this hypothesis I measured the temperature drop over 30 second intervals for 5 minutes in boxes lined with each material. I compared this temperature drop to the

INTERMEDIATE DIVISION – CONSUMER SCIENCE

temperature drop recorded with out insulation. The result was that the R-6 fiberglass batt limited heat loss better than the R-3 extruded polystyrene did.

Project Number: MCS006

Grade: 7

Title: How Full Is Full?

Abstract: The purpose of my project was to optimize the amount of product loaded into a hopper car, thus lowering the amount of trips needed to be taken, reducing costs and traffic. I hypothesized that if I used more than one hole then the loading efficiency of the cars would increase. Experimental testing proved this hypothesis. To get test results I used a funnel to load a hopper car then calculated the amount of space and money this would cost companies. I learned this could save approximately \$1 million for companies shipping 100,000,000 kilograms of product a year.

Project Number: MCS007

Grade: 7

Title: Battery Life and Cost Analysis

Abstract: Batteries are very important to everyday life. The purpose of this experiment is to see which battery has the longest life and is least expensive. Nine brands of batteries including two generic brands were tested two times each, and the voltage was recorded for each trial. Duracell Ultra performed the best, but Giant Eagle Pro-Power and Nuon performed well also. Giant Eagle Pro-Power and Nuon cost the least and performed very well. If I were to repeat this experiment, I would use more generic batteries for cost comparison.

Project Number: MCS008

Grade: 7

Title: Antibacterial Products: Do They Work?

Abstract: My experiment's purpose was to find out if antibacterial products work as they claim to work. My hypothesis was "If I test different antibacterial products, then the Germ-x will kill the most bacteria." I have learned what products kill the most bacteria out of the ten products I tested. I have also learned that my hypothesis was wrong. The Germ-x didn't kill the most bacteria. The most bacteria was killed by both the Bath and Body Works Lotion and the Equate Soap. I think the lotion worked well because it stayed on the gelatin, while the instant hand sanitizers dissolved.

Project Number: MCS009

Grade: 7

Title: Suction Cup Strength

Abstract: To find suction holders to hold decorations on windows that really work. This work intends to find out which suction holders are able to hold as the advertisement reads. Different brands will be tested to identify which has the best suction strength. Each test will have about 10 suction holders. The weight will be designed to be the same for each suction holder. It is believed that it will take a name brand to be the strongest. In future work find other surfaces where suction holders work and hold.

Project Number: MCS010

Grade: 7

Title: Comparing The Absorbtion Rate Of Polyacrylamide

Abstract: The purpose of this investigation wwas to determine which diaper would best protect a baby at night. In this investigation, the following diapers were used Huggies, Pampers, Ultra Stretch and Luvs. Sodium polyacrylate is found in diapers' fluffy layer. It is used for absorbency.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

i determine the more polyacrylate the more absorption. Increasing polyacrylate will increase the diapers mass. I found that Pampers which ended up being lighter than the cloth diaper but heavier than the disposable diapers retained the most water.

Project Number: MCS011

Grade: 8

Title: Affect of Cooking Methods on Foods

Abstract: Being a member of a family with three children, I often find my mother trying to find a meal that is fast and tasteful. I decided to find a cooking method that is fast and also provide tasty food. For my experiment, I tested two different vegetables that were cooked in the following ways: baked, microwaved, boiled, steamed, and cooked in a pressure cooker. I collected the following data on the vegetables: weight, length, taste, and texture. I concluded that the biggest difference among the cooking methods was taste of the vegetables.

Project Number: MCS012

Grade: 7

Title: Truth in Advertising

Abstract: Soda is something many people enjoy very much. This work was intended to learn if Coca-Cola, Sierra Mist, Dr. Pepper, or Seagram's Ginger Ale contained as much soda as stated on the can. Each soda can was first weighed with the soda, then was poured into a graduated cylinder to determine the volume, and was finally weighed without the soda. It was determined that Sierra Mist had the most soda, then Coca-Cola, then Seagram's Ginger Ale, and Dr. pepper which had the least amount of soda. Future work is planned to test different brand soda cans.

Project Number: MCS013

Grade: 8

Title: Effect Of Swimsuit Material On Drag

Abstract: The purpose of my experiment is to find which swimsuit materials has the least amount of drag. Each swimsuit was cut into a 10cm by 10cm square, a pocket was added, and a penny was placed inside. The sample was dropped ten times through a three-meter cylinder filled with water, and the time was recorded. The Fastskin is the fastest, second was the Aquablade, third was the Reversible, and the slowest is the standard suit (control). Swimmers would want to wear the Fastskin swimsuit when racing so they would be fastest through the water then the swimmers wearing one of the other three suits.

Project Number: MCS014

Grade: 8

Title: Durability of Paint

Abstract: Consumers purchasing paint often look at the price before considering the durability of the paint. If they see a lower priced paint, they may be likely to buy that paint. Three different types of paints from two different manufacturers were tested: acrylic, latex, and oil-based paints. Trials exposed three boards of each type to heat, cold, and rain conditions. This experiment showed that the more expensive oil paint provided the greatest percentage of protection against the elements.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS015

Grade: 7

Title: Strength of Garbage Bags

Abstract: Abstract was not submitted electronically. The strength of garbage bags is a problem that people are still trying to figure out. That is why I decided to test the strength with three different brands of garbage bags: Giant Eagle, Glad, and Hefty. To do this, take one of the garbage bags and drop a 500 gram weight into the center of the bag, use increments of ten centimeters until it breaks. Complete 3 trials with each brand. The result of this project was Hefty had the most strength out of the two other brands.

Project Number: MCS016

Grade: 7

Title: Cell Phone Reception

Abstract: The purpose of this project is to determine which cell phone company has the best reception. I compared the following companies AT&T, Verizon, Cricket and T-Mobil. Each time the phone was used the number of cut offs were tallied. This was done for 5 days and the data was averaged. AT&T average about 2 cut offs a day while cricket average around 4 to 5 cut offs. This was due to the number of open frequencies the company purchased. Recently AT&T merged with Cingular creating a monster company increasing their number of frequencies.

Project Number: MCS017

Grade: 7

Title: Do Wood Treatments Affect Strength and Flammability of Pine?

Abstract: The purpose of this study is to determine the effect of latex paint, oil-based paint, shellac and varnish on the strength and flammability of pine. Uniform samples of pine were individually treated with the test agents and allowed to cure. Pine samples were left untreated to establish a control. The strength of the pine samples were tested by clamping them to a table and adding graduated weights. Failure was determined by the first sign of cracking. The samples were also tested for flammability by holding the samples 25 mm away from a candle flame. A stopwatch was used to determine the time it took for each sample to ignite. The results of each test was recorded, averaged, and analyzed to determine how the four agents affected the strength and flammability of pine. The information learned in this study will help consumers to understand how paints, shellac and varnish affect pine and allow them to select the product that strengthens the wood without increasing the danger of fire.

Project Number: MCS018

Grade: 7

Title: Rotten World Among Us

Abstract: This project was to find out what materials could slow down the growth of mold. Knowing that mold can be brown, it was recorded when the potato turned brown. Learning from the judges at the school fair that the potato turning brown was just discoloration, it was discovered that what really was tested was which material slowed down decomposition. Orange juice and water did the best job at preventing decomposition. The potato in those jars was not soggy, but was still fairly hard. Future testing is planned to see if these substances slow down decomposition in other foods.

Project Number: MCS019

Grade: 7

Title: Does The Brand of Paint Ball Matter?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS020

Grade: 8

Title: Which Wood Stain is the Least Absorbent?

Abstract: I have selected this topic to determine which stain is the least absorbent. I hope to prove that oil-based stain is more efficient than others. I cut thirty-six pinewood squares and covered each piece with a different stain. Next, I soaked them in a bucket for approximately twelve days while observing the wood. I concluded that Behr was the least absorbent and best choice. second was Minwax, tied in third was Zar and Olympic, last was my control. Therefore my results were not the same as my hypothesis. i was correct by saying that the oil-stain would be the best choice.

Project Number: MCS021

Grade: 7

Title: Ripening Green Tomatoes

Abstract: Green tomatoes are left in gardens at the end of the season. This investigation determined if green tomatoes ripen under different conditions. Tomatoes of the same variety and size were placed in separate paper bags. A control group had tomatoes only. The other bags had the variables: banana, orange peels, newspaper, and coldness. The tomatoes were compared to the USDA Tomato Grading Chart and days recorded. This process was repeated three times. The banana ripened the fastest averaging 4 days faster than the orange peels and newspaper. Literature suggests that ethylene produced by the banana helped to ripen the tomatoes.

Project Number: MCS022

Grade: 8

Title: Floating Through the Air

Abstract: Many people think hot air balloons are beautiful. I did this experiment to determine which material is safest for hot air balloons. Nylon, polyester, and cotton were tested. They were attached to a wooden frame and an ice pick was dropped on them while they were either heated or unheated. The number of drops it took to puncture each fabric was recorded. Polyester was determined to be the best because it was never punctured. Unheated and heated nylon were punctured after one drop. Unheated cotton was punctured after an average of five drops; heated cotton was punctured after one drop. In the future, I plan to test other fabrics for durability.

Project Number: MCS023

Grade: 8

Title: Comparisons of Laundry Detergents

Abstract: Today, the many makers of laundry detergents claim to be the best. I wanted to settle this argument once and for all. I soaked a sheet, which was cut into 36 strips, in grape juice, and then washed the strips in three different brands of laundry detergent. Each brand had twelve strips. The results were surprising: when I held the strips up to the allotted Grey scale, the strips were all the same color after they were done washing. The brand or cost does not matter because all the strips turned out the same.

Project Number: MCS024

Grade: 8

Title: Lick It!

Abstract: The purpose of the experiment was to determine how saliva affects the dissolving a sugar compound. Salivary amylase was used in a controlled setting to determine how many licks it would take to completely dissolve a candy lollipop. The experiment showed that approximately 1000 "licks" are necessary to consume the food substance.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS025

Grade: 7

Title: Stains Are Pains

Abstract: When testing solutions Welch's 100%Grape Juice, Daily's Little Hug Blue Raspberry, Original Coca-Cola, and A&W Root Beer to determine which would leave a stain. It was apparent that Welch's was the only one that did. I performed this project because I know others like me spill liquids on clothing and I wanted to know why certain liquids leave stains. The average stain left by Welch's was 4 centimeters by 6.4 centimeters. The outcome occurred because the grape's dark natural pigment left a faint stain and the artificial ingredients are easier to remove.

Project Number: MCS026

Grade: 7

Title: How Effective Are Antacids?

Abstract: My grandfather had Acid Reflux Disease when he was still alive. I have always been interested in medicines for the symptoms of this disease. Ten different antacids were used in this experiment. Five were brand name and five were generic name antacids. I mixed dilute hydrochloric acid with each antacid and then used the process of titration with sodium hydroxide to determine the best antacid. The data supported that Alka Seltzer was the most effective antacid. In the future, This investigation could be conducted with more trials.

Project Number: MCS027

Grade: 7

Title: Ease of Writing on Lokta Paper

Abstract: In the countries of Nepal and Tibet, a paper made of the bark of the Lokta bush is extremely common. The experimenter received some of this paper as a gift and experienced great frustration with skipping on it when using ball-point pens. It was decided to research whether a mass-market BIC ball-point pen would be outperformed in fluidity of writing on Nepalese Lokta fiber paper by an alternative mass-market BIC product. Contrary to the experimenters hypotheses, all pens performed equally well.

Project Number: MCS028

Grade: 8

Title: Which Is The Best Overall Bandage

Abstract: I selected this project because I never can figure out which bandage I need to purchase. I conducted three experiments on bandages. Which brand is most durable? Which brand is most adhesive? Which brand has the best vapor permeability? Nexcare and Homebest were the most durable out of my testing. Dollar Tree brand and Curad were tied for number one for the adhesive test. Homebest was the best for the vapor permeability test. My project will benefit everyone who experiences trauma to the skin.

Project Number: MCS029

Grade: 8

Title: The Neutralizing Time Of Antacids

Abstract: Antacids are used for heartburn associated with acid indigestion and sour stomach. This project was intended to find out which antacid has the fastest neutralizing time. The three products used were Prilosec OTC, Zantac 75, and Roloids. These three products were tested for how fast it took for the neutralization of the pH level, and then recorded in a data table. It was determined that Prilosec OTC was the fastest at neutralizing the acid. Zantac 75 was in second, Roloids last. If this project were to be repeated the antacids should have been left in longer than ten minutes.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS030

Grade: 8

Title: Battery Life vs Composition

Abstract: Batteries are needed in everyday life. This experiment intends to identify the battery composition that produces the longest working life. Three different types of composition will be tested (regular alkaline, lithium, and rechargeable batteries.) It is believed that lithium will last the longest because it is used for longer lasting purposes such as, watches. The Lithium batteries are more expensive. In the future I would test different battery sizes and identify which one would last longer.

Project Number: MCS031

Grade: 7

Title: Riding with Angles

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MCS032

Grade: 7

Title: What Are You Putting In Your Mouth?

Abstract: Lead is present in 57 million households in the United States. Once lead enters the human body it gets into the digestive system and from there enters the blood stream where it can damage all major organs. Reports on the Internet state that lead is still present in some food containers, especially those from foreign countries. This experiment was designed to test the hypothesis that lead will be present in some metal cans from foreign countries. Thirteen cans from 11 different countries were bought at a supermarket and ethnic stores. Cans were emptied. The inside and outside of each can was tested for the presence of lead using lead-testing kits bought at Lowe's Home Improvement store. One piece of lead solder (50 % pure lead) was also tested. The piece of solder showed a bright red color indicating the certain presence of lead. Five of the cans showed no color change indicating the absence of lead. Of the remaining cans, 5 showed a gray with pink color and 1 showed a dark purple. The result of the experiment was not conclusive as none of the cans showed the bright red color indicating the sure presence of lead. The cans showing pink or purple test-results suggest that some lead may be present. A person from the testing company said that dark gray color indicated the presence of tin. The experiment could be improved by making sure that each test was done on can-seams, (not the sides of cans) the most likely place for lead to be present.

Project Number: MCS033

Grade: 7

Title: Evaluating Antacids

Abstract: A common problem that people suffer from is acid reflux disease. Numerous drugs are available to alleviate this condition. Prescription drugs can be quite expensive. An investigation was conducted to analyze the effect of the over-the-counter remedies. Under controlled conditions, 5 brands of antacids were made into powder and added to a 10% acid solution. At regularly timed intervals, the pH was evaluated using pH test paper. While all antacids did raise the pH to a near neutral solution, one proved more effective and that was Roloids.

Project Number: MCS034

Grade: 7

Title: Battery Wars

Abstract: Would generic batteries last longer than brand name batteries, and which would have the most value on every dollar. My hypothesis was that brand name batteries would last longer

INTERMEDIATE DIVISION – CONSUMER SCIENCE

and have the most value. For my procedure, I first had to gather all of the materials, then built an apparatus to hold the flashlight about 40cm away from the light meter. Next I had to label all the flashlights which brand of battery was in them, and then I had to turn each flashlight on. Last I had to measure the light intensity for each flashlight every hour until they were burnt out, and then record all of my data. My hypothesis was proven correct.

Project Number: MCS035 Grade: 8

Title: Effectiveness of Sunscreen

Abstract: Sunscreens are used to protect your body from exposure from Ultra Violet Rays. This project was intended to find out which sunscreen had the most sun protectiveness. The products used were Banana Boat, Coppertone, Mary Kay, and Bull Frog. Each product was spread on a film and the level of sun exposure was recorded. It was determined that Coppertone had the best sun protectiveness. Banana Boat was second, then Mary Kay in third. Bull Frog came last. If this project was to be repeated then there should be different types of sunscreen brands.

Project Number: MCS036 Grade: 7

Title: A Battery's Life by Brand

Abstract: Since batteries are used in every day life, this investigation was conducted to see if one brand of battery is better than another. To conduct the investigation, first three battery holders and three light bulb receptacles were wired together. Then, three batteries, from one of three brands, were tested every 15 minutes and the voltage was recorded. It was determined that brand B, Radio Shack, lasted longer than brands A, Energizer, and C, Duracell. Future work could be done by testing other brands with the Radio Shack brand to see if it is really the best brand.

Project Number: MCS037 Grade: 7

Title: The Rotten Truth About Garbage

Abstract: Americans create 41 lbs. of waste a day, 25% of it is recycled and the rest goes to landfills. So how much waste does my family of 3 create in a day? For 10 days I conducted an experiment by weighing my family's garbage and comparing it to my hypothesis that we'd accumulated 51 lbs of garbage a day. At the end of 10 days, my family amassed 49.5 lbs of garbage in 10 days. Since $49.5/10 = 4.95$ this is very close to my hypothesis of my family creating 51 lbs of garbage a day. The reason I did this experiment is because I did an environmental experiment before and enjoyed it.

Project Number: MCS038 Grade: 8

Title: Nike Power vs Top Flite

Abstract: Abstract was not submitted electronically.

Project Number: MCS039 Grade: 8

Title: Accentuate The Positives, Eliminate The Negatives

Abstract: This science fair project was chosen because people frequently take pictures, and don't instantaneously get them developed. What should people do with the film while waiting to develop it? From the results of this project, one could determine the best place to store film without the risk of damaging the pictures. It was hypothesized that dry, cool environments will be preeminent for the preservation of film. Each camera was labeled, placed in a zip lock bag, and

INTERMEDIATE DIVISION – CONSUMER SCIENCE

left in different environments for a period of time. Over this time, temperature was recorded. At the end of experimentation, photographs were developed, and results were observed. The hypothesis was proved correct, and dry, cool environments were best for the preservation of film.

Project Number: MCS040

Grade: 8

Title: Properties of Duct Tape

Abstract: My experiments purpose was to find out if Duct tape was the true all purpose tape. I picked this topic because I know that people use the tape all the time, but I wanted to find out what, if anything, duct tape not good at. My problem statement was, "Does Duct tape exceed all other tapes in all scenarios." My hypothesis is that duct tape will exceed all tapes and come out on top for all tests.

Project Number: MCS041

Grade: 7

Title: Grease Away

Abstract: My problem was which liquid hand soap cleans grease off hands the best. My hypothesis was that Dove would clean the best. First I poured 50ML of grease on my hands. Next I poured 25ML of the soap on my hands, then rubbed my hands together and waited for the soap to start to foam. And then I washed my hands in hot water, and got as much grease off as I could. Then I recorded how much grease was left on my hands. I did this by using a substance that makes grease watery so it would slide off my hands. Then I recorded my data. My hypothesis was proven correct.

Project Number: MCS042

Grade: 8

Title: Which Drain Cleaner Works the Best!

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number MCS043

Grade 7

Title: Adhesive Bandages

Abstract: For my project my problem was to find out which brand of bandage is most adhesive to skin.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES001

Grade: 7

Title: Other Plants on Other Planets

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES002

Grade: 7

Title: The Effect Of Various Water On Plant Growth

Abstract: The purpose of this project was to determine if different types of water would promote plant growth. The plants were watered with tap, spring and distilled waters. In each case the plants had the same number of plants and water with the same amounts of water. plants watered with spring water grew and germinated best. This was due to the increased amounts of mineral present in the water. These minerals typically are minerals that are naturally found in soil in trace amounts. When administered to plants regularly stimulate plant grow and germination.

Project Number: MES003

Grade: 7

Title: The effect of Photosynthesis on the Rate of Transpiration

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES004

Grade: 8

Title: How Does Common Water Pollutants Affect Pond Algae?

Abstract: Pond algae are affected by water pollutants causing algal blooms which contaminate and turn the water green. This experiment tested several common pollutants on green alga, Spirogyra. The algae sample was divided into groups with pollutants applied to each group. The experiment was observed and the vitality and chlorophyll levels were recorder of the samples. Motor oil and coolant actually promote growth and the dish wash solution had the greatest effect. In future plans, I would like to test for photosynthetic rate and use a wider variety of pollutants.

Project Number: MES005

Grade: 7

Title: Are the Creeks In This Area Clean?

Abstract: Creek ecology is essential to the ecosystem. Everything relies on water and it's contents. I did this project because everybody should be concerned with water quality, after all, it's essential for all living things. I simply collected 4 different water samples from 3 different areas(rural, suburban, and urban). I used water from Mingo Creek, Saw Mill Run, Peters Creek, and Flick Run. I tested them with a 'do-it-yourself' testing kit which included materials to test for Hardness, pH, Iron, and Alkalinity. I also toke the temperature of the water. In conclusion, each creek was indeed polluted in one way or another due to enviornmental reasons and other factors.

Project Number: MES006

Grade: 7

Title: Measuring "Magnetic Storms"

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES007

Grade: 8

Title: Can Beta Carotene Fight Cancer in Plants?

Abstract: Beta carotene, or vitamin A is an antioxidant, which can fight different cancers in humans. The purpose of my experiment is to determine whether beta carotene can prevent cancer from growing in plants. Three sets of four green bean seeds were planted. Groups one and three were watered with tap water. The second group was watered with a beta carotene solution. The plants in groups two and three were inoculated using a plant carcinogen. Group one grew normally. A cancerous crown gall grew on one of the plants in group three. The rate of growth in groups two and three slowed after inoculation.

Project Number: MES008

Grade: 8

Title: Forecast Unclear

Abstract: Meteorologists are not always correct so in this project, it was tested how accurate the forecasts are, and if what they are saying proves true. Every day for three weeks, it was recorded the five day weather forecast for each day. It was resulted that 91% of the time the forecasts are correct. The one-day weather forecasts were the most accurate, however, the five-day weather forecasts were accurate also. This study was performed because it is interesting to see if the weather forecast we watch and read about every day is correct.

Project Number: MES009

Grade: 7

Title: Which Fertilizer Helps Plants Most?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES010

Grade: 8

Title: The Effects of Soil Type on the Rate of Herbicide Leaching

Abstract: The goal of this study is to determine the effect of soil type on the leaching of herbicides into the water supply. The hypothesis to be tested is that leachate from porous soils will contain a higher concentration of herbicide than leachate from soil that is absorbant. Containers will be filled with equal amounts of either commercial topsoil, gravel or sand. The bottom of each container will be perforated to allow for drainage. Commercial herbicide solutions will be prepared following packaging directions to simulate consumer use. Equal volumes of the herbicide will be poured onto each container. The leachate from each container will be collected and the volume recorded, graphed and analyzed. 5 mL of leachate from each container will be used to run a lettuce seed bioassay. Bioassays will also be conducted using 5 mL of distilled water and 5 mL of the original herbicide solution to establish a control and a basis of comparison. The results of the bioassays will determine which leachate contained the highest concentration of herbicide. A second phase will be conducted using the same containers and following the same procedure. In this phase, distilled water will be repeatedly added to each container. The leachate will be collected after each addition of distilled water and used to run bioassays. The purpose of this phase will be to determine which soil type retains the highest concentration of herbicide. These two series of experiments will determine how soil type affects the leaching of herbicide into the water supply. This knowledge will allow consumers to judge how to safely use herbicides based on the type of soil it is being applied to and thus minimize its effect on the ecosystem.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES011

Grade: 8

Title: Mine Safety

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES012

Grade: 8

Title: What Barriers Best Prevent Dust Erosion?

Abstract: The goal of this project is to determine the most affective type of barrier to reduce wind erosion at a construction site. A model will be constructed to simulate a construction site where soil has been exposed to wind. To model the construction site, topsoil will be placed on a flat surface. A blow dryer will be used to simulate wind blowing over the exposed soil. The distance the soil was displaced and the mass of the eroded soil well be measured, recorded, and graphed. These trials will be repeated five times to establish a control. Three types of wind barriers will be constructed and placed between the wind source and exposed topsoil. The distance the soil is displaced and the mass of the eroded soil will be measured for each test barrier and compared to the control. Again, each trial will be repeated five times to assure the validity of the study. The data will be thoroughly analyzed to determine which barrier is most affective at reducing erosion. This study will aid the construction industry and benefit environmentalist by identify the best barrier to use to reduce dust pollution at construction sites.

Project Number: MES013

Grade: 7

Title: The Effect Of Freezing On Seeds

Abstract: The purpose of the project was to determine the effect of freezing on seeds. Mung bean seeds were chosen for this project and exposed to freezing for 0hrs, 6hrs, 12hrs, 24hrs, and 48hrs. While researching I discovered that farmers use this technique to encourage germination. Many seeds require a resting period after falling from the parent plant before they are able to germinate into new plants. Plant growers who wish to shorten the period of seed dormancy in seeds with undeveloped embryos can do little; germination may be induced, however, in seeds having mature embryos by abrasion of the hard coat, by soaking in water or by using chemicals like sulfuric acid, by heating to crack the seed coat, or by alternate freezing and thawing. By the last day, I found that 24hr grew the tallest however 12hr germinated the highest number of seeds.

Project Number: MES014

Grade: 8

Title: Which Wood Will Rot and Which Will Not?

Abstract: Wood has a significant importance to our society. I intended to determine how wood absorbed water and the effect this had on its characteristics. Eight containers were filled with twenty-four ounces of water and each type of wood tested was placed into one of the containers. The weight of the wood was recorded before being placed into the container and daily observations recorded. It was determined that mold appeared on the Black Walnut first, Maple gained 6.05 oz. in weight and cedar absorbed the least amount of water increasing its weight by 2.15 oz. Future work is planned to study woods that are mold resistant.

Project Number: MES015

Grade: 7

Title: The Effect Of Music On Plants

Abstract: The pur pose of this project was to determine if music improved the growth rate of plants. It is natural for plants in the wild to be subjected to movement by wind on a nearly constant basis. Somehow this movement benefits the plants. If the plants lack this natural

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

movement they don't thrive. Sound is also a kind of movement. Sound is created by vibrations in the air. Some types of sound can also set up vibrational movement in the surrounding environment, which might include plants and the tables which they are sitting on. Some types of sound do make the plants grow better (faster and stronger). The plant exposed to consistent vibration grew 0.41 cm taller than the control plant.

Project Number: MES016

Grade: 7

Title: Greenhouse Gas: Hotter and Wetter?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES017

Grade: 8

Title: Fish On

Abstract: The purpose of this experiment was to determine if the temperature and pH of pond water affects fish in their natural habitat. My neighbor's pond was divided into 6 grids. A pH meter and thermometer were used to record the pH and temperature readings of each grid. Fishing in each grid took place for 30 minutes and the number of fish and specie was recorded. A comparison of the pH and temperature of each grid was made to the amount and specie of fish caught. I concluded that a temperature of 9.5 degrees Celsius and a pH level of 7.49 in grid 6 produced the most fish.

Project Number: MES018

Grade: 8

Title: Effect off Water Depth on Tsunami's

Abstract: Tsunamis are a dangerous force. Work intended to experiment and evaluate different depths of water and its effect on tsunamis. A tsunami wave simulator was built and testing was done at three different levels of water. The wave was created by wood shifting upward to simulate the sifting of tectonic plates. Peak run-up, wavelength, and other various factors were recorded. Each water level was tested three times for better accuracy. Results showed the deeper the water, the higher the wave of a tsunami and its force. Results are hoped to be of use in future tsunami alerts.

Project Number: MES019

Grade: 7

Title: Particle Size Analysis

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES020

Grade: 8

Title: How Can We Get More Power?

Abstract: I tested the effects of changing materials of turbine blades on the speed of the turbine in a hydroelectric plant. I hypothesized that changing the materials would not affect the speed, which would change the energy output. My hypothesis was correct. The largest variation between the speeds of the materials was 0.6 rpm. I did this because it is very important to be able to get maximum energy output from power plants. I got this idea because energy has always been an interest of mine. I also couldn't do my original project, which was changing things on wind turbine blades.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES021

Grade: 8

Title: Wind Power

Abstract: My purpose for doing this experiment was to see how wind power works. I hypothesized that if the wind catches the blades of the propellers, then it will spin bringing up a clay ball. I was prompted to do this research because I find wind power interesting and with more research, could be one of the world's most widely used resources. In this experiment, I hope to achieve a better understanding of how this power source works and what makes it work. With this knowledge, I hope that I can do something better in this field of power and help continue research on it.

Project Number: MES022

Grade: 7

Title: The Effect Of Gibberillic Acid On Plants

Abstract: The purpose of this project is to Determine if increased amounts of gibberelin will increase the growth rate. Gibberellins is a natural plant hormone that simulates plant growth and/or germination. Plants were exposed to 0ml, 5ml, 10ml, 15ml, 20ml, and 25ml of gibberellin. The best germinated and tallest plant were plant exposed to 5ml of gibberellic acid. This plant grew an average of 25.3cm and germinated the highest number of plants. Overall, the increased concentration of gibberellins caused the plants to both germinate and grow faster, however when the gibberellins became over powering the plants growth decreased slightly.

Project Number: MES023

Grade: 7

Title: A Study of Soakage Trench Composition

Abstract: Soakage trenches are used to absorb storm run-off in urbanized areas to conserve water and reduce localized flooding. In this research project, models of soakage trenches were constructed using empty soda bottles. The purpose of this study was to determine what material was the most effective absorbing agent. The materials tested included sand, soil, diapers, gravel, moss and sponge. Equal volumes of water were poured into the top of each bottle. The bottom of each container was perforated to allow the water to drain. The amount of water was added in 50 mL increments until water dripped from the bottom of the container. The amount of water absorbed was recorded. The amount of water that drained from the container was also recorded. The data collected was recorded, averaged and analyzed to determine the material that was most absorbant. Additional studies will be conducted in which multiple absorbants are used to produce the most effective soakage trench. The development of a soakage trench that could absorb large amounts of run-off in a short period of time could reduce flooding in urbanized areas and help conserve water for later use.

Project Number: MES024

Grade: 8

Title: Ambient Light and Stars

Abstract: In my experiment, I found how the city's, suburb's, and country's varying amounts of ambient light affect the number of stars visible in that area. To determine this I created a star-viewing frame, which made sure that each time I tested I looked at the same stars in the constellation Orion the same way. Results showed that the city averages 4 stars per "view"; the suburbs, 8; and the country, 15. To extend my project, I plan to conduct testing with a light meter, to find the actual amount of ambient light in each area.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES025

Grade: 7

Title: What Manmade and Natural Items Will Biodegrade The Most?

Abstract: I hypothesize that if I test ten different manmade and natural items in a compost bin, then the banana peel will biodegrade the most. The purpose of my project is to find out which materials will decompose and break down the most, and to find out which is better for the environment. In my data I found that my hypothesis was correct. I also found that overall, the natural items are better for the environment. I learned that some things will biodegrade fast, but other things might lay in a yard or on a road for years to come.

Project Number: MES026 Grade: 8

Title: The Effect of Plumbing Systems on Geysers

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES027

Grade: 7

Title: Effect of Acid Rain on Germination

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MES028

Grade: 8

Title: Melting Ice

Abstract: The purpose of the experiment was examine if global warming may affect the world's ocean levels. The small scale experiment involved measuring the salt water level before and after exposure to melting ice cubes in a controlled setting. The results showed that melting ice caused the salt water level to rise by the volume of the ice cube. The results provide clues that may help in predicting future weather scenarios on Earth.

Project Number: MES029

Grade: 8

Title: Alternate Fuels For Emergencies

Abstract: The purpose of my experiment is to determine which alternate fuels (from animal droppings) are suitable for heat when no other sources are available. I think that the buffalo droppings will give off the most heat. I will take llama, cow, buffalo, and horse manure and dry them on an old window screen above a bunch of light bulbs. When dry, each sample is put in a combustion chamber and ignited. The total heat content will be measured using a balloon that is connected to the open end of a 3' length of copper pipe.

Project Number: MES030

Grade: 7

Title: The Effect Of Colored Light On Plant Growth

Abstract: The purpose of this project is to determine if various colored light enhance growth. In this experiment I grew plants wrapped in various colored plastic wrap under a plant light. During research I found that each color gives off a certain wave length. Since plants grow using photosynthesis I determined that plants growing under red light would grow best. This is because red light gives off the longest wave length. According to the data the it was a fight between the black and the red. Black plants were trying to find a light source therefor producing cells quickly. Black eventually died. Red then became the fastest growing and most germinated pplant.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES031

Grade: 8

Title: How do Tornados Form

Abstract: Tornados are very destructive in everyday life. This work intended to learn how tornados form from a violent column of air. A tornado generator box was constructed to form a tornado from a mist machine installed in the bottom, to a fan installed to the top. It was determined that the tornado formed excellently through out the results in the process. Further research shows that tornados form from a super cell thunderstorm. Scientists agreed that the first stage in tornado formation is an interaction between the storm updraft and the winds. Most have an average diameter of about 50 meters.

Project Number: MES032

Grade: 8

Title: Can Aeration Remediate Mine Drainage?

Abstract: My family owns a coal mine that is no longer in production. The mine drainage presents a serious environmental problem and must be remediated before it can be released into a local stream. The purpose of this study is to determine if aeration is more efficient and cost effective for remediating the mine drainage than our current practice of cleaning the water using a series of settlement ponds. The first phase of this study will be an evaluation of the iron content in the mine, the 3 settlement ponds, and the water ready to be released into the environment. Lettuce seed bioassays will also be conducted using samples from these 5 locations. In the second phase, water will be collected directly from the mine and divided into 100 mL samples and aerated using an airstone connected to an air pump. The samples will be aerated for 24 hours, allowed to settle for an hour and then tested for iron content. This process of 24 hrs of aeration, 1 hr of settling and iron level evaluation will continue for 14 days. The change in iron level will be recorded, graphed and analyzed. The data will determine if aeration is a better method to remediate mine drainage than the traditional usage of settlement ponds. This information will help my family determine how best to solve our long term problem remediating the drainage from our mine.

Project Number: MES033

Grade: 8

Title: Metal Mayhem

Abstract: Broken pipes are always a problem. This experiment determined what type of pipe is least susceptible to heat and cold. I tested 3 different metals including iron, aluminum, and copper. It was determined that iron proved invaluable for piping in both the warm and cold tests. Iron, though heavy, is the best choice for almost any piping. In the future I plan to freeze an Iron, aluminum, and copper pipe with water inside to see how it can withstand the water expansion.

Project Number: MES034

Grade: 8

Title: What is the Effect of Weather on Different Metals?

Abstract: The Purpose of this experiment is to find out how fast and how much metal rusts. I chose This experiment because I am interested in chemistry and rusting is a chemical change. First I put all of the metal outside so it was equally exposed. Then I observed each metal sample once a week. I have observed that the carbon steel and the titanium alloy rusted almost completely. The aluminum and stainless steel didn't rust at all. I have concluded that stainless steel and aluminum will not rust. The titanium alloy will rust faster than any other metal.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES035

Grade: 7

Title: Does Acid Rain Affect Plant Growth?

Abstract: I chose this experiment because the Pittsburgh acid rain level is very high, and I wanted to see what effect it had on plants. First, I prepared petri dishes with paper towels, corn seeds, and acidic water in them. There were 9 petri dishes for pH 2, 3, 4, 5, 6, and 7. The lower pH's had shorter roots. The higher pH's had longer, and thicker roots with root hairs. If these seeds were to be planted, than the lower pH's would not survive. My conclusion is that the acid rain is harmful to plants in Pittsburgh.

Project Number: MES036

Grade: 8

Title: The Effect Of Music On Plants

Abstract: The purpose of this project is determine if various types of music would promote plant growth. Music is a sound wave, and more specifically, a pulse wave. This simply means that it is formed by areas of higher and lower pressure in the atmosphere through which it travels. These extremely small changes in air pressure have an effect on plant growth. For example, plants which are subjected to a gentle breeze or which are placed on a gently moving surface grow faster and stronger than plants which are kept virtually still. Rap music grew 4.4cm taller than the control and 3.1 cm taller than country. According to research there are some benefits to movement and vibration of the seeds of the plants. These benefits include a taller and stronger plant.

Project Number: MES037

Grade: 8

Title: Water Willow Cutting Success

Abstract: I worked at a Golf Center cleaning pond over-growth. Branches left on the ground continued growing. I wanted to know what length cuttings would not grow. To prove this, I placed five of each length of cutting (5cm, 7.5cm, 15cm, 20cm) in different test tubes with 15 ml of water. After eight weeks, I recorded the color, number, and area of the leaves, and the number and length of stems and roots, and the mass of the cuttings. The 7.5 cm length cuttings grew the best, the 15 cm cuttings grew second best, and none of the other cuttings grew.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER001

Grade: 7

Title: Ahoy, Matey!

Abstract: What type of boat will sail a distance of 80cm fastest, a yawl, ketch, or sloop? My hypothesis is that of those 3 designs, the ketch will sail the fastest. I used an 80cm trough, 6L of water, a stopwatch, a 17cm wooden boat model, a 90cm dowel rod that is 4mm thick, a fan, a glue gun, cardboard, a hack saw, 40cm x 40cm piece of utility canvas, a measuring cup, fabric scissors, a drill with 4mm drill bit, and clay. Make the sails. Next, make 3 holes down the boat with equal lengths between them. Then place one of the sail designs on the boat and place in a trough filled with 6L of water. Place the fan at one end of the trough and turn on low, make sure that the cardboard is in front of the fan until it is at full speed. Then remove the cardboard and time the boat's trip to the end of the course. Repeat this step 9 times; 3 trials with each sail. Last record the times and find the averages. My hypothesis was proven correct.

Project Number: MER002

Grade: 8

Title: Shaky or Stable?

Abstract: The purpose of my experiment, "Shaky or Stable?", was to test what type of structure frame is the strongest under pressure. I built three structures out of K'Nex pieces. The first was a regular rectangular frame, the second had diagonal bracing, and the third had cross bracing. My procedure was to place weight on the top and sides of the structures and record what happened. My results showed that the structure with cross bracing was strongest in both tests, and the structure with no bracing was the weakest. I concluded that frames with more cross bracing can hold more weight.

Project Number: MER003

Grade: 7

Title: Combustion Consumption

Abstract: Abstract was not submitted electronically.

Project Number: MER004

Grade: 8

Title: Pumped Up Prices

Abstract: The purpose of the experiment was to see how feasible it is to construct a usable paint ball gun. A pump action paint ball gun was constructed using materials such as pvc pipe. Then the performance of the gun was compared to actual paint ball guns. Overall, it was determined that one can construct a simple paint ball gun with average performance abilities.

Project Number: MER005

Grade: 7

Title: Is There a Point to Aerodynamics?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MER006

Grade: 7

Title: London Bridge is Falling Down

Abstract: Which bridge design will hold the most weight - a truss, arch, or cantilever? My hypothesis is that the arch bridge design will hold the most weight, more than an arch or cantilever. To begin, a support was assembled with 3 pieces of wood and 4 dry wall screws to form a "u" shaped support. A ruler was taped to the wall behind the center of the support starting

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

at the base. The bridges were assembled out of balsa wood and hot glue. Lead weights were then added progressively. After each placement the stress level of the bridges were recorded. The data collected reflected that the arch bridge collapsed at 1,218g of weight. The truss collapsed at 8,400g of weight. The cantilever collapsed at (right side)420g and (left side)336g of weight. Therefore, the truss bridge held more weight, and did not support my hypothesis.

Project Number: MER007

Grade: 8

Title: Destructive Welding

Abstract: My whole purposes in doing this experiment is to find out if an inert gas welder produce a stronger weld than any other welder. I wanted to do this experiment because my dad has been welding with an arc welder for many years while places like places like Orange County Choppers use inert gas welders. My problem states: "Does inert gas welding produce a stronger, cleaner, and superior weld?" My hypothesis was that inert gas welding does produce a overall better weld because it shields the weld from the Earth's atmosphere.

Project Number: MER008

Grade: 7

Title: Blastoff: Bottle Rocket Flight

Abstract: Rocket technology is one of the most important aspects to exploring the universe. I chose to do this project to learn more about rockets and the effect of wings on rocket flight. I made six bottle rockets, attached wings to them, then launched them and recorded how far each flew. In this experiment the rocket with zero wings did best. This was unexpected, because the wings were relatively heavy. In a future experiment, I would recommend that all rockets with a different number of wings should weigh the same overall.

Project Number: MER009

Grade: 7

Title: Good Wood and Great Composites

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MER010

Grade: 8

Title: Breaking Point

Abstract: Trees are a plentiful resource on our Earth. This work intended to find the breaking point, elasticity, and strength of five different types of wood, which included Cherry, Yellow Pine, Oak, Walnut, and Plywood. The wood was cut to the same size and clamped to a table and tested by using a bottle jack and scale to measure the pressure applied until each sample had snapped. It was determined that the strongest type of wood was Oak and the weakest was Cherry. Future work is planned to test different wood samples for wood strength.

Project Number: MER011

Grade: 8

Title: Do Supplemental Additives Reduce the Corrosion of Concrete

Abstract: Concrete is a naturally pourous, which will allow the permeation and penetration of liquid media. Concrete is used universally as a material of construction. Due to the need for structural stabliity, corrosion of concrete is a major concern. This study is designed to determine the effectiveness of adding supplemental additive to reduce the porosity of concrete. Four concrete mixtures will be blened. Standard type 1 Portland cement will be the standard raw material in each mixture. The supplemental additives will be Flyash and micro silica. The individual test mixtures will be blended and cast int 3 x 6 cylinders and allowed to cure for 7 days.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

After 7 days cure, the cylinders will be submersed into salt solution and allowed to soak for 28 days. The salt solution will be colored with an identifying dye to help distinguish penetration into the concrete. After the 28 day conditioning period the concrete core will be cut and penetration of the liquid media will be measured. Compressive strength will also be determine on the core sample to determine any chemical effect or corrosion on the cores. The data collected will be charted, graphed and analyzed to determine how supplemental additives affect corrosion of concrete. The information learned will be useful in determing the proportion of additives that will most affectively reduce corrosion and allow our roads, buildings and dams to withstand environmental weathering.

Project Number: MER012

Grade: 8

Title: I Won't Let You Down Truss Me

Abstract: A lot of bridges have multiple trusses on them for extra support. But how much stronger does each truss make the bridge versus how much heavier it makes the bridge. First, I weighed a simple beam bridge on a produce scale and then tested how much weight it held. I did this for a three bridges, and make a ratio of the weight of the bridge over how much weight the bridge held before it broke. This was the basis of my science fair project.

Project Number: MER013

Grade: 7

Title: Sound Insulating in Buildings

Abstract: Noise is a negative factor in most homes and needs to be reduced. For this project, commonly available materials were inserted into a cross-section of an interior wall. Trials were conducted to determine which material would provide the most soundproofing. Using a game buzzer and a decibel meter, an average of three trials was calculated for a more accurate rating. It was found that pink house insulation, normally used for heat insulation purposes, was the most effective at reducing noise by trapping sound within its fibers. In future experimentation, more materials and their costs would be explored.

Project Number: MER014

Grade: 8

Title: Power Crazy

Abstract: The purpose of the experiment was to explore the difference between different materials that could possibly be used to create electric power lines. I created 3 model power lines and tested their performance in voltage. I tested copper, chrome, and graphite models. The results showed that copper wiring provides the best material for power lines.

Project Number: MER015

Grade: 8

Title: Hot Water Heat

Abstract: Solar energy is being used more and more around the world. This work was intended to determine if the color of a solar collector affects the temperature of water. Black and white solar collectors were constructed and set up in my yard facing the south. Water was placed in the collectors for approximately 15 minutes and the temperature recorded. It was determined that the water in the black solar collector was warmer than that in the white solar collector. Future work is planned to test different colored solar collectors.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER016

Grade: 7

Title: Simulating The Ocean Tides To Create Electricity

Abstract: The goal I am attempting to achieve is to create electrical power by using the effect of water tides. The purpose of my project is to utilize resources economically, safe for the environment, and renewable. I made a model simulating tides being used to create water flow, turning gears on a motor, and generating an electrical current. Through my research I have learned tides are always available. Future work is planned to use a larger tank and different materials to create a stronger water flow.

Project Number: MER017

Grade: 7

Title: Hydro Powered Burglar System

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MER018

Grade: 7

Title: Serves Up!

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MER019

Grade: 7

Title: American Idle

Abstract: Ever wonder if it makes any difference which grade of gasoline you use? My project investigated which grade of gasoline makes your lawnmower perform the best: Regular, Plus, or Super. To do this, I conducted three tests: 1) Which grade makes your lawnmower run the longest, 2) Wheel Speed, and 3) Engine Power. The results indicated that Super grade gasoline performed the best in two out of the three tests I conducted and was very close to being the best in the third. Although it costs the most, Super appears to be the best for lawnmower performance and the environment.

Project Number: MER020

Grade: 8

Title: Slammin' and Jammin'

Abstract: Brake lights were added to automobiles to advise following drivers when a stop was occurring. However, the brake lights do not signal what kind of stop is occurring – an abrupt “slamming” of brakes or a gradual deceleration. This work intended to learn if a person’s braking response time was affected by different brake signals. It was determined that the “slamming” brake resulted in a quicker reaction time for the majority of subjects. This study showed that an additional brake light displaying sudden braking would be a good safety device.

Project Number: MER021

Grade: 8

Title: Flying High

Abstract: Aerodynamics is used on airplanes to make them fly. This experiment was intended to learn which wing design would rise the fastest and which was the most consistent in the air. Five different model wings were tested, and each one was tested five times before coming to a final conclusion. It was determined that the model wing with the least curve had both qualities. The data table supports this information about the smallest curved wing. You can conclude from this

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

that objects with more curve to them, but with ones that are small have good smooth flowing lines.

Project Number: MER022

Grade: 8

Title: Bridge size vs Bridge Strength

Abstract: It is hard to go anywhere without seeing a bridge. But what makes them work? The purpose of this experiment was to determine the relationship between the size of the bridge and the strength of the bridge. I constructed three beam, truss, and suspension bridges at different lengths. Then, I put weight on each of the bridges until they gave way. It was determined that the beam bridge was the weakest and the truss bridge was the strongest. Future work is planned to test the accuracy of this conclusion.

Project Number: MER023

Grade: 8

Title: Too Hot to Handle

Abstract: Computer performance is affected by many variables; does this include computer processor fans? This work intended to learn if a computer processor fan with more revolutions per minute (RPM) would increase a computer's performance by cooling the computer more and therefore allow faster data flow. The computer program Winbond Hardware Doctor for Windows was used to determine how well a computer performed when running the computer processor fan at different RPM's. It was found that a faster running computer processor fan increased performance and therefore accelerated data transfer.

Project Number: MER024

Grade: 8

Title: Bridge Construction

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MER025

Grade: 7

Title: Self-Retrieving Fishing Reel

Abstract: My goal is to construct a self-retrieving fishing reel. A self-retrieving fishing reel is the basic design of a bait cast reel, except after casting, the need to reel in is eliminated. My intention was to come up with a unique invention. Because fishing is one of my favorite things to do, I wanted to invent some type of fishing gear and chose building a self-retrieving fishing reel as my project. Constructing a self-retrieve fishing reel was a success. Although it was a much larger model than what I expected and it only casts about two meters.

Project Number: MER026

Grade: 8

Title: Don't lower the river, build a bridge

Abstract: In this experiment, I build two different bridges and tested the strength difference between them.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH001

Grade: 8

Title: Do eggs have bacteria?

Abstract: I chose to do two experiments, both involving testing the shells of different types of eggs for bacteria. These experiments were chosen because people can get sick if egg shells have bacteria. For the first experiment, the shells of standard, organic, and free-range eggs were tested for bacteria. For the second experiment, the eggs were cleaned in both 60 C and 30 C water and tested for bacteria. For the first experiment, the standard eggs had the least bacteria, and the organic eggs had the most, and for the second, the eggs that were washed in 60 C water had the least bacteria.

Project Number: MMH002

Grade: 8

Title: Does Hair Structure, Texture and Strength Relate?

Abstract: Hair care is essential. This work intended to learn if there is a relationship between hair structure, hair texture, and hair strength. Hair samples from three ethnic groups were measured, analyzed, weighed, and categorized. It was determined that the hair texture does not affect the strength of the hair. The undamaged hair texture tolerated more weight than the partially and highly damaged hair. There is no specific type of hair that is stronger than others.

Project Number: MMH003

Grade: 8

Title: Too Clean?

Abstract: Would you believe me if I said that the dirtier the soil, the better? Well, that's what my project was about. I used mustard seeds and observed their growth over 6 days. 3 of them were controls, and the others had their soil sterilized by baking, and their water sterilized by boiling. As it turned out, the soil which was not baked supported better plant growth than the sterilized soil. The dirtier, the better!

Project Number: MMH004

Grade: 7

Title: The Effect of Ionizing Radiation on Plant Growth

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MMH005

Grade: 8

Title: The Effect Of Chocolate On Bacteria

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MMH006

Grade: 8

Title: Which facial cleanser works best?

Abstract: I did this experiment because I always wondered which facial cleanser worked best on face bacteria. I took five different facial cleansers and tested their zone of inhibition and how well they inhibited E Coli from growing around them. My results were that Clean and Clear facial Cleanser worked the best and following close behind was Pure Zone. This could help many consumers because now they do not have to waste their money buying different facial cleanser and testing which cleanser works best.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH007

Grade: 8

Title: The Effect Of Sanitizer And Soap On Bacteria

Abstract: The purpose of this project is to see which hand sanitizer or hand soap deters bacteria best. Using petri dishes and nutrient agar bacteria was exposed to the plates. Half of the plates were exposed to hand sanitizers and half were exposed to hand soap. According to one study, regular soap will kill about 99.4 % of the bacteria on your skin. Antibacterial soaps increase it to only about 99.6 %. Bacterial resistance happens because 0.4 % of bacteria isn't kill by soap or hand sanitizers. Hand sanitizer was the most effective means of inhibiting bacterial growth by deterring ore than 10 colonies more of bacteria than hand soaps.

Project Number: MMH008

Grade: 7

Title: Forensic Science

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MMH009

Grade: 7

Title: Keep Your Bread in the Light

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MMH010

Grade: 8

Title: Which store has the cleanest meat?

Abstract: The purpose of this project is to see which store has the safest meat. The meat was swabbed with sterile water on a sterile swab and then the agar was swabbed. The agar plates were kept in an incubator and the results were recorded after twenty-four and forty-eight hours. The results showed that the 2nd National brand meat had the cleanest meat and the local store had the most bacteria growing. In conclusion the 2nd national brand meat had the safest meat.

Project Number: MMH011

Grade: 7

Title: Does liquid or solid soap inhibit bacteria the best?

Abstract: I did this project because people want to have the least amount of bacteria on them as possible. Consumers would like to know the conclusion of this project so that they will know which type of soap to buy. I did this experiment by swabbing agar plates with staphylococcus epidermis bacteria, punching four holes into the agar, and by filling the holes with the appropriate soap. The results of the experiment ended up to be that both liquid and solid soaps had about an equal zone except for Dial Liquid. Dial Liquid acted as an outlier in the data.

Project Number: MMH012

Grade: 8

Title: Reducing Bacterial Growth in Kitchens

Abstract: Bacteria grow everywhere, including the kitchen. This work intended to learn if the use of different dishwashing products (sponge, dish brush, and dishcloth) and different rinsing methods would reduce bacteria amounts. The dishwashing devices were rubbed with a moistened cotton swab that was smeared onto a sterile petri dish, and observed for bacteria growth twice. In the first part, the dishwashing device was new. In the second part, each was dirty, cleaned in a different method, and tested. The dishcloth was found to retain the largest amount of bacteria, and the boiling water cleaning method reduced the most bacteria.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH013

Grade: 7

Title: To Grow Or Not To Grow?

Abstract: Have you ever been sick and wondered which medicine would do a better job at curing you. This work intended to figure out which substance worked better at inhibiting bacterial growth. Four different substances (Listerine, Betadine, Gentamicin, and penicillin) were soaked into filter disks and placed on agar plates swabbed with bacteria taken from the mouth, incubated for 36 hours, and the diameter of inhibited bacterial growth measured. The experiment determined that penicillin worked best at inhibiting bacterial growth. To follow up this experiment more substances could be tested, or different types of bacteria tested upon.

Project Number: MMH014

Grade: 8

Title: The Effect Of Mouthwash On Bacteria

Abstract: The purpose of this project is to determine which mouthwash most effectively deters bacteria. Bacteria results in bacterial or dental plaque. Mouthwash reduces the number of "unprotected" bacteria on the tongue, cheek but do not penetrate the protective, sticky plaque very well. Bacteria do not eat away at the tooth. Bacteria are capable of producing organic acids trying to create a low pH environment where they are better capable of living. The consequence of this acid production is the enamel of the tooth is comprised mainly of calcium, which is soluble in acids. This causes tooth decay by the dissolving away of calcium from acids created for the comfort of the bacteria. Cepacol inhibiting the most bacterial growth. Mouth Rinse came in second with an average of 18.6 colonies and Scope came in third with an average of 19.9 colonies.

Project Number: MMH015

Grade: 7

Title: The Pressure's On

Abstract: Abstract was not submitted electronically.

Project Number: MMH016

Grade: 7

Title: The Effect Of Caffeine On Daphnia

Abstract: The purpose of this project is to deter the effects of caffeine on the heart rate of a daphnia. The drug caffeine increases the blood pressure, stimulates the central nervous system, promotes urine formation, and stimulates the action of the heart and lungs. Caffeine inhibits cyclic nucleotide phosphodiesterases. These enzymes are responsible for degrading a stimulatory signal produced when excitatory neurotransmitters activate different neurons in the central nervous system (CNS). When they are inhibited by caffeine, the stimulatory signal remains active longer resulting in a greater sense of alertness (a CNS effect) but also a higher heart rate, blood pressure and respiratory rate. With increased amount of caffeine the daphnia's heart rate increased then decrease possibly because the amounts of caffeine were too toxic causing the shut down of various systems.

Project Number: MMH017

Grade: 7

Title: How much bacteria is on pop cans?

Abstract: The title of my project was "How much bacteria is on pop cans?" I chose this project, because I wanted to know how much bacteria you are infecting your mouth with while drinking from a pop can. I did this project by swabbing different types of pop can storage and growing

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

bacteria. The results of my project were that the pop cans that were stored in the 6-pack had the most bacteria and the cubed had the least. The conclusion of this experiment is that it's safer to drink from a glass than a pop can, because of the bacteria.

Project Number: MMH018

Grade: 8

Title: Effect of Bacteria on Rusting Time

Abstract: The purpose of this investigation is to determine if bacteria effects rusting time. Each individual iron nail was measured and placed into a 7mL test tube. 4cc of distilled water was placed inside the test tube along with the selected bacteria. Visual observations were made once a week for a six-week period, and then at the end of the six-week period the results were graphed. During the six-week period there was barely a difference between the nails placed in bacteria and the other nail samples. Future studies could include soaking the nails in the liquids for at least six months

Project Number: MMH019

Grade: 8

Title: Effects of Green Tea on E. Coli

Abstract: Green tea has been used medicinally and possesses a number of beneficial qualities. This project intended to learn if green tea was effective in inhibiting the growth of the bacterium Escherichia Coli. Petri dishes were labeled with different concentrations of green tea and E. Coli was spread on each. It was determined that green tea is effective in preventing the growth of E. Coli. Future work is planned to see if salmonella is equally as effective.

Project Number: MMH020

Grade: 7

Title: Microwaves Affect on Bacteria

Abstract: Sponges are proven to be breeding grounds for bacteria. I chose this experiment to learn about how to keep kitchens sanitary and kill bacteria on sponges. For the procedure, I swabbed a sponge that I used for a week and cultivated the bacteria. Then, I microwaved the same sponge for 1 minute, and cultivated the bacteria. I did this with three sponges. I hypothesized that the microwaved sponge would have no bacteria. I concluded that the microwaved sponges had bacteria, but much less than the non-microwaved sponge. My conclusion was wrong, but the results were still applicable to society.

Project Number: MMH021

Grade: 8

Title: Squeaky Clean

Abstract: Anti-bacterial soap is an important factor in keeping your family clean and healthy. This work intended to determine which anti-bacterial soap was the most effective. Six different types of soap were used to wash my hands. Culture plates of lamb's blood were inoculated by touching my fingers to the plate and placed into an incubator for twenty- four hours. Each plate was compared by counting the number of bacterial colonies. It was determined that Soft soap was the most effective in reducing the amount of bacteria on my hands and Nice and Clean was the least effective. Future studies may include a different variety of anti-bacterial soaps tested.

Project Number: MMH022

Grade: 8

Title: Beverages Effecting Teeth Enamel

Abstract: Most people don't realize how important their teeth are. Also they don't know how a simple beverage can have a dramatic effect on their enamel. The purpose of this experiment was

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

to see what liquid had the most effect on teeth. Ten hard boiled eggs were placed in sealed jars for three weeks in one cup of each of the ten beverages. It was determined that vinegar had the most effect and diet dr. pepper had the least effect. Other observations were taken daily, but vinegar and diet dr. pepper had a major difference.

Project Number: MMH023

Grade: 8

Title: Effect of Age on Lung Capacity

Abstract: The purpose of my experiment was to find if age effects lung capacity. I tested a total of ten different subjects. The groupings were ages young-6-12, teens-13-20, twenties-21-35, middleaged-36-54, and seniors-55 and over. I found that my predictions were fairly close to what I thought. I thought the middle ages would have the best lung capacity. It turned out that the middle aged-36-54 years old, were the best. This is how the experiment turned out.

Project Number: MMH025

Grade: 8

Title: Effects of UV Light on Surfaces

Abstract: UV lights are used in sterilizing a wide variety of things including surfaces in hospitals, labs, and food processing plants. The purpose of my project was to determine on what surface the UV light would kill the most bacteria. I used stainless steel, corian, granite and formica. I exposed each surface to the light for time increments of 10, 20 and 30 seconds, washing in between. I then swabbed them and incubated for 24 hours. The bacterial count was lowest on the stainless steel surface; slightly more on the formica, more on corian and highest on granite. Further Studies include testing wood, glass and ceramic.

Project Number: MMH026

Grade: 8

Title: How Effective are Mouthwashes?

Abstract: The purpose was to find out the effectiveness of mouthwash. After hearing comments by advertisers, friends, teachers, parents and my dentist I was curious to learn the truth. I hypothesized that if you used Listerine mouthwash, then it will prevent the most oral bacteria growth. Oral bacteria were collected and treated with four different mouthwashes and water. Samples collected were placed in an incubator. Data showed that treatment with each of the four mouthwashes resulted in a decrease in bacteria growth. From the results, Scope was the most effective in killing oral bacteria both short and long term. Consumers should question claims by advertisers.

Project Number: MMH027

Grade: 8

Title: What is the Effect of temperature on Fungus Growth?

Abstract: The problem being investigated is how temperature effects the growth and development of fungus in Petri a dish.

Project Number: MMH028

Grade: 8

Title: Does Caffeine Make Your BP -

Abstract: Caffeine, a mild stimulant to the nervous system, is found in many popular products including chocolate, coffee, medications, pop, and tea. This work intended to learn if caffeine affects a person's blood pressure after exercise. Subjects consumed set amounts of caffeinated soda and then participated in aerobic exercise. The subject's blood pressure was measured before and after consumption of the beverage and aerobic exercise. It was found that athletic

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

subjects did not experience a large increase in blood pressure, nor was there a large increase in blood pressure when comparing consumption of decaffeinated and caffeinated drinks.

Project Number: MMH029

Grade: 8

Title: The Effect Of Caffeine On Planaria

Abstract: The purpose of this project was to see if regeneration is increased when planaria was exposed to caffeine. Caffeine is a stimulant drug which increases some body functions. For this project the planaria was cut in half and placed in varying amounts of caffeine (one or two drops). In this investigation on regeneration, if the planarian lived to regenerate, both the groups with their heads on and the groups with their tails on showed a pattern of faster regeneration rate up to day 3. Between day 3 and day 4, the control group with the head on significantly regenerated between during a day. It seems that group C with the head on slowed down regeneration by now, only from 75% on day 3 to 100% on day 4. A possible explanation is that I did not know exactly at what time between my observations each of the planarian completed regeneration. It is possible that group C with head on completed 100% regeneration shortly after I recorded its 75% regeneration.

Project Number: MMH030

Grade: 7

Title: The Effect Of Light On Planaria

Abstract: The purpose of this project was to determine what would occur if various amounts of light were shined upon the planaria. Planarian have eyespots in the head region. Planaria's "eyes" are light sensitive spots that allow planarians to avoid direct sunlight. They spend most of their life on the underside of rocks and leaves. The planarian was always placed in the center of the square. The square was 4cm x 4cm. Movement around the entire block is one square cm. Movement on one side of the square is .25 sq. cm. Test were conducted 3 times and averaged. The planarian's body is more specialized for sensory perception and locomotion takes place in the direction of specialization. The planarian used in this investigation definitely was affected by the intensity of light.

Project Number: MMH032

Grade: 8

Title: Honey's Antibacterial Activity

Abstract: This experiment was performed to learn more about the antibacterial properties of honey, because there is information that shows that honey works well against antiseptic-resistant bacteria. This was tested by swabbing the bacteria Escherichia coli, Staphylococcus epidermis, and Serratia marcescens on agar plates and filling wells in the plates with two UMF rated honeys, a brand name honey wound gel, and a standard table honey. Controls of hydrogen peroxide and sterile water were used. Zones of inhibition were measured. The results showed that the UMF 10+ honey inhibited the bacteria best and Staphylococcus epidermis was inhibited best by all honeys.

Project Number: MMH033

Grade: 8

Title: Plant Cancer and Nutrients

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH034

Grade: 8

Title: The Effect Of Size On The Growth Rate Of A Seed

Abstract: The purpose of this investigation was to determine if size was a factor in the way a plant grows. According to research, seeds that are too small do not provide the seedling with enough nutrients for the plant to grow appropriately. However the opposite effect occurs when the seeds are too large. The seed needs extra time for the seed coat to soften. This may cause the seed to begin to rot leaving few plants to survive. The 2cm seed even with the poorest survival rate had the highest average rate with an ending height of 45.25 cm. It also produced the highest and largest leaves. This may be due to the extra nutrients provided from the cotyledons.

Project Number: MMH035

Grade: 8

Title: Is it safe to eat at an office desk?

Abstract: I chose to do this project because I wanted to see if it is safe to eat at your desk instead of a lunch table. First, go to an office and swab office equipment. Incubate for 24 hours and check the bacteria grown. Incubate for another 24 hours and check the bacteria. The office supply that had the most bacteria was the keyboard. The office supply that had the least amount of bacteria was the arms on the chair. Therefore, it is not safe to eat at an office desk and you should eat at the lunch table.

Project Number: MMH036

Grade: 7

Title: Emergency! Slow the Flow!

Abstract: Which material works best as a water diversion to help block flood waters? First, I gathered my materials. Then I built and painted a "flood table" out of plywood, pine strips, hinges, hot glue, and paint. Then I sewed the burlap bags. I filled 60 burlap bags with 59.15mL of mulch, gravel, soil, and sand. I then filled a 1000mL measuring cup with water. Next, I placed the 5 bags across the center of the table. Then I poured the water down the flood table. Next, I recorded how much water was collected. Continue the procedure for each type of medium. I found that none of the materials stopped the water. But, they did slow the flow. This caused me to change my testing procedure to timing how long the water took to get past the bags. With this new measurement, my hypothesis was proven correct.

Project Number: MMH037

Grade: 8

Title: The Effect of CO on Bacterial Growth

Abstract: CO is responsible for over 220 deaths each year. Klebsiella Pneumoniae is a bacterium that infects people with weakened immune systems. In a recent study, it was seen that CO prevented rats from infections after organ transplants. In this experiment, I am testing the effect of CO on bacterial growth by exposing plates of Klebsiella Pneumoniae to CO through an exposure chamber. My hypothesis is that the CO will inhibit the bacteria at low levels, and will kill all of the bacteria at high levels. My results showed that CO has differing effects on all the different strains.

Project Number: MMH038

Grade: 7

Title: Resolve to dissolve

Abstract: This project was intended to determine which of six brands of daily multivitamin/multimineral supplements would dissolve to the greatest extent within a 24 hour period of time. The procedure was executed by placing one of each brand in its own glass of

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

200ml room temperature tap water, and then recording the dissolution of each through 30 minute intervals throughout 24 hours. The results proved that Centrum Regular - Advanced Formula dissolved most completely. Vitamin World Time Release Mega Vitamin dissolved the least, despite the fact that it was one of the most expensive brands.

Project Number: MMH039

Grade: 7

Title: Effect of soap/hand sanitizer on bacteria

Abstract: I chose to do this experiment because I wanted to learn if it was better to wash your hands with soap or to use hand sanitizer. I took five agar plates and swabbed them with bacteria and put four disks on each plate soaked in a different hand solution except the control. For the next two days, approximately 24 hours apart, I measured the zone of inhibition. The results were that the liquid hand soap worked much better than the hand sanitizer. My conclusion disproved my hypothesis which stated that the hand sanitizer will work better than the soap

Project Number: MMH040 Grade: 7

Title: The effect of sanitizers on bacteria

Abstract: I performed this experiment to find if hand sanitizers could really inhibit bacteria on one's hands. I used the school computer lab and placed hand sanitizers at four computers. I swabbed eight computers, four with hand sanitizer and four without hand sanitizer. I left the computers for four weeks, swabbing every seven days. I left it in the incubator for forty-eight hours, and counted every twenty-four hours. In conclusion, I found that the hand sanitizers did not inhibit bacteria as I hypothesized.

Project Number: MMH041

Grade: 8

Title: Effectiveness of the 3 Second Rule

Abstract: I chose this experiment because I saw a similar experiment last year and wanted to know the results. Bread was dropped on the floor of a classroom and cafeteria, left there for three seconds, and swabbed onto agar plates. Agar plates were incubated and examined for bacteria after 24 hours. Classroom showed it was safe to follow the three second rule. Results for trial two in the cafeteria were inconclusive because bacteria grew on the control section. It may be safe to oblige by the three second rule if the surface food has been dropped on is clean.

Project Number: MMH042

Grade: 7

Title: Don't Forget to Wash Under Your Fingernails

Abstract: I hypothesized that if boys and girls washed their hands identical amounts of time, then their results would be equivalent, but washing longer would remove germs better. The purpose was to show that washing for the recommended amount of time removes germs from under fingernails. Different subjects placed glo germ under their fingernails, then washed, and saw how many remained. I found while boys and girls washed their hands equal amounts of time, boys didn't get as many germs out as I hoped. Longer time periods removed more germs. I learned if hand washing is improved, problems could be avoided.

Project Number: MMH043

Grade: 8

Title: Culturing Mice and Cancer Cells

Abstract: Cancer is one of the major factors of death in the world today. This work is not only intended to learn how DOX and MMC drugs affect cancer cells, but also to find similarities of mice

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

and human cancer chromosomes after being treated with the drugs. P53+, P53-, and WMP2 cell lines are used for this experiment. All of the cell lines are then treated with DOX and MMC. The results show that mice cells closely resemble human cancer cells. If so, we can use mice instead of chimpanzees for other human cancer research. Mice are cheaper and much efficient.

Project Number: MMH044

Grade: 7

Title: Does Meditation have an Effect on Blood Pressure?

Abstract: The purpose of my investigation is to find out how meditation effects blood pressure.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH001

Grade: 8

Title: Overcoming Colorblindness by Color Measurement

Abstract: This project solves the problem of color matching paint, blind, and carpet samples for colors that people with common color blindness have difficulty seeing and matching – reds and greens. I visited a technical center and used a spectrophotometer to measure my samples and obtained Hunter L,a,b color scale data for each. I used a spreadsheet of the data to create tables and calculate color difference values and compared the data for each sample. Based on the data alone, I was able to select reasonable matches for my paint, blind, and carpet samples, which were confirmed by visual observation.

Project Number: MPH002

Grade: 8

Title: Slope to Science Success

Abstract: The purpose of my experiment was to find which angle would allow a golf ball to travel at optimum height and distance. To do this, I built a ramp that adjusted to various different angles. I launched the golf ball from the ramp five times and measured the distance traveled with a paper tape measurer. I then found the approximated peak height by using the guess and check system. After finding the peak height I launched the golf ball five times to find an average height.

Project Number: MPH003

Grade: 7

Title: The Effects of Tire Pressure on Stopping Distance

Abstract: The goal of this project is to determine if the air pressure of the tires on a dirt bike effects the stopping distance of the vehicle. The hypothesis to be tested is that as the air pressure in a tire decreases there will be more contact with the ground and stopping distance will decrease. Additionally, it is believed that as the pressure increases, the tire will bounce along the ground and stopping distance will increase. The dirt bike rider will accelerate to a speed of 4 km/hr and at a predetermined distance, apply the brakes. The stopping distance will be Measured, recorded, averaged, graphed and analyzed. 10 trials will be done at tire pressures of 10, 12, 15, 17 and 20 psi. This study will determine if tire pressure is a factor in stopping distance. Air pressure may be a safety issue that riders may need to check before they ride their cycles. This experiment may show that air pressure is a critical to child safety as the use of helmets.

Project Number: MPH004

Grade: 7

Title: Electromagnets

Abstract: Abstract was not submitted electronically.

Project Number: MPH005

Grade: 8

Title: Out of Tune

Abstract: For my Science Fair project, I tested the Coefficient of Thermal Expansion on different metals, and combinations of metal and plastic. To do this, I chose different woodwind instruments and tested them in different temperatures. The law of Thermal Expansion states that when temperatures increase, the particles that make up matter expand, causing the whole object to expand. Because metal expands when heat increases, the diameter of the instrument increased very slightly. When the diameter increased, the vibrations created when a note is played change, and we understand that note to be “sharper” or “flatter” than a note that is perfectly in tune, according to the A-440 scale. I measured this change using a tuner, which measures how far a note is away from perfectly in tune. The reason that I got different results for different

INTERMEDIATE DIVISION – PHYSICS

instruments is because they are not all made out of the same metals, and some are metal coated in plastic. Because different metals have different coefficients of thermal expansion, the results would not be the same. Density also affects the results of the experiment. A thicker instrument, like an alto saxophone, will expand slower than a thinner instrument, such as a piccolo.

Project Number: MPH006

Grade: 7

Title: The Physics of a Curve Ball

Abstract: The curveball is a key pitch in every baseball game. This project was designed to investigate whether rotations and speed affect the amount of curve on a curveball. Five different numbers of rotations and three different rates of speed were used. Each pitch was simulated with a different number of rotations and a different rate of speed. The number of centimeters away from the center of the plate was recorded. It was determined that a slower speed and a larger number of rotations causes the most amount of curve on the ball. Faster speeds and fewer rotations produced less curve.

Project Number: MPH007

Grade: 8

Title: Which Insulation Heats Homes Best?

Abstract: The insulation used in homes makes a difference in temperature. This work is intended to determine if the type of insulation keeps homes warmer than other types of insulation. Three boxes of the same size, with lids, were lined with the three types of insulation. One cup of warm water was set in the boxes for three trials of 30 minutes. After 30 minutes, the temperature was taken. It was determined that Fiberglass Insulation kept water heated the most. Bubble Wrap was the worst insulation to use. Future plans are to test any other types of insulation.

Project Number: MPH008

Grade: 8

Title: Momentum on the Move

Abstract: The purpose of my experiment was to demonstrate how potential energy is converted into kinetic energy to move a billiard ball. I built a pendulum and a track beneath it to direct a ball onto a ramp. I ran repetitive tests by raising the pendulum with various weights to specific heights and releasing it to strike a billiard ball sending it up the ramp. The data was graphed, showing relationships among pendulum height, weight, and ball movement. Then by running various random pendulum setups, I saw that the graphs were able to predict how far the ball moved.

Project Number: MPH009

Grade: 8

Title: The Effect Of Friction On Shoes

Abstract: The purpose of this project is to determine if various soled shoes increase the friction rate. Shoes of various types were dragged across a flat surface and an inclined plane. Attached to the shoe was a spring scale to determine the amount of work in newtons. Friction results from two surfaces rubbing against each other or moving relative to one another. It can hinder the motion of an object or prevent an object from moving at all. The strength of frictional force depends on the nature of the surfaces that are in contact and the force pushing them together. This force is usually related to the weight and material of the object. The shoe that was made with rubber and was rough had the greatest amount of newtons... the tennis shoe.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH010

Grade: 7

Title: Get a Charge Out of Static

Abstract: The purpose of this project was to find out what materials could be charged with static electricity. This experiment involved building an electroscope to detect the presence of static electricity and then testing thirteen different materials to see if they were charged and how much... The foil strips in the electroscope moved apart when itâ€™s exposed to an electrically charged material. The static charge was measured and recorded in three trials. The experimental data supported my hypothesis that materials that are not conductive can be statically charged and conductive materials will transfer their charges easily and will not stay charged.

Project Number: MPH011

Grade: 8

Title: The Friction Factor

Abstract: In everyday life people exercise by playing sports on numerous surfaces. This investigation was intended to discover if alternative surfaces could be used for everyday sports. Four common surfaces were tested. A shoe with weights of 50g, 100g, 150g, and 200g was pulled across each surface and the amount of friction exerted was measured. This was then repeated, but instead the four surfaces were wet. Statistically the most friction shown was on the Astroturf surface. Future investigation is planned to determine whether sports can be played on alternative surfaces, which may vary the skill level of the game.

Project Number: MPH012

Grade: 8

Title: Static Electricity

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH013

Grade: 8

Title: How Can We Control Currents?

Abstract: The reason I did this experiment was to demonstrate how to control an electrical current. I choose this topic because there are so many things that most people don't know about electricity. My problem statement was: "How can I control a current to dim a light." My hypothesis was that creating a rheostat would show how a current can be controlled.

Project Number: MPH014

Grade: 8

Title: Hockey Ball Temperature and Bounce

Abstract: Street Hockey is played in many different temperatures. The style of ball must be appropriate to the temperature. This investigation was designed to see which type of hockey ball worked best in each temperature. Each ball was dropped from 360 centimeters and the height of the bounce was recorded. The ball designed for colder temperature bounced lowest in all temperatures because it is naturally softer. A follow up would include testing more low density hockey balls.

Project Number: MPH015

Grade: 8

Title: Diving Board Deflection

Abstract: Abstract was not submitted electronically. I decided to conduct the experiment Diving Board Deflection because I wanted to learn how much a diving board flexed with different

INTERMEDIATE DIVISION – PHYSICS

amounts of weight. What I did to make this experiment possible was create a scaled down version of a diving board. The next step I followed was placing weights with different amounts of mass on the diving board model I created earlier. After accomplishing that step, I used a Height Gauge to measure the deflection of the model with each weight. I discovered that the more weight that was applied to the model, the more it deflected.

Project Number: MPH016

Grade: 8

Title: The Effect Of Triangles On A Truss Bridge

Abstract: I choose my project because I wanted to build my own structures. I wanted to prove that the more triangles mean the more strength. I built the bridges and tested them by adding pennies to the bridge. The control bridge held the least amount of mass, while the five triangle bridge held the most. The four triangle bridge and the three triangle bridge held more mass than the control but less than the five triangle bridge. With this data I concluded that the more triangles a truss bridge has the stronger it will be.

Project Number: MPH017

Grade: 8

Title: The Effect on the Sound Made by Different Lengths of the Same Metal

Abstract: I choose this topic because I am interested in sound. I hoped to prove when I hit the metal rods the pitch would be higher as the rods got shorter. The experiment procedure was to hit the control rod of steel, then hit the next rod and compare sounds, repeat the process with the rest of the steel rods, repeat the process with the aluminum rods. The results were the same for both metals. The shortest rod, the control made the highest sound the other rods made lower sounds as length increased. My experiment proved my hypothesis.

Project Number: MPH018

Grade: 8

Title: The Effect Of Size On The Descent Rate Of A Parachute

Abstract: The purpose of the project is to determine if size changes the descent rate of a parachute. I compared 4 different sizes of parachutes (20x20cm, 30x30cm, 40x40cm, and 50x50cm). Each parachute was drop from the same heights with equal amounts of weight. What was found was that as the chutes became larger it slowed the descent rate. The larger chute captured the air causing the chutes to slow down and have longer air times than the smaller chutes.

Project Number: MPH019

Grade: 8

Title: Aviation Nation

Abstract: My question is can the length of a gliders wings and the shape of the wings effect the path of its flight? I hypothesized that yes, the length of the wings and the shape of the wings will affect the paath of its flight. The longer the wings the straighter the flight. As far as the shape, the tapered wings will make it go straighter. The materials I used were balsa wood because it is really light and it will not weigh the plane down at all. I also used two metal clamps to balance the weight. Finally, I used a hammer, glue, and a cutting knife. My procedure was to research gliders and their different wings. Next, I bought all the materials that are needed to build the glider and their wings. Then I cut out the glider's body and the wings on different shapes and sizes from the balsa wood. I put each of the different wings on the glider and then flew it. (repeat this step until all the different wings have been tested). Last, record the data. The longest wings and the tapered wings worked the best on the glider. It let the glider fly the farthest and in the straightest path.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH020

Grade: 8

Title: Viscosity in a Bottle

Abstract: This experiment demonstrated that the viscosity of a liquid varies as its temperature changes. Objects fall through a liquid more slowly as the viscosity increases. I dropped four different weights into a bottle of shampoo at seven different temperatures and timed the descents with a stopwatch. The times for each weight increased as the temperature dropped, and decreased as the temperature went up. I conclude, therefore, that for this shampoo, the viscosity increases as the temperature drops, and falls as the temperature increases. Follow up work might be to repeat the experiment with different liquids and plot the results.

Project Number: MPH021

Grade: 8

Title: Heat Produced by Combustion

Abstract: The question "How much heat is produced by the combustion of nuts?" isn't asked very often, but it was answered. After conducting this experiment, it was found a filbert nut contains the most energy. To find this, obtain two cans, one small and one large, and purchase a can of nuts. After punching holes in the cans, begin to find results by lighting a nut and placing it under the cans, one of which is filled with water. Measure the temperature of the water with each nut sample. This experiment was conducted to find which nut produces the most energy.

Project Number: MPH022

Grade: 8

Title: Magnetic Fields and Euglena

Abstract: Euglena cells thrive in fresh water springs. This work was done to see the effect of magnetic fields on the cells in different periods of time. Three different time periods were used on same sized drop of the euglena culture and the effect was recorded. The results revealed that the euglena cells were dying when exposed to the high power magnets. There was no effect when exposed to low power magnets. Future work is what is the effect of light on the euglena cells.

Project Number: MPH023

Grade: 8

Title: Fin Flight

Abstract: My question was "Does the shape and design of the fins affect the rockets altitude and speed?" My hypothesis was that the slanted finned rocket would have the greatest speed and that the eight-finned rocket would have the greatest altitude. My hypothesis was wrong in both speed and altitude. I built 3 rockets out of the same material and the only variable was the fins. As the rockets were launched, I calculated the altitude with the Alti-Tracker and I had someone time the flight. The results were: Slanted fin rocket's average speed was 84km/hr and it's altitude was 70 meters. The eight finned rocket's average speed was 157 km/hr and it's altitude was 33.3 meters. The three finned rocket's average speed was 92 km/hr and it's average altitude was 80.6 meters.

Project Number: MPH024

Grade: 7

Title: Chill Factor

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH025

Grade: 7

Title: Comparison of flight Time of Different Paper Airplanes

Abstract: My project is to find characteristics of a paper airplane with the best flight time. I tested different airplane designs made with the same paper. The planes varied in aspects such as Center of Gravity, Wing Dihedral-Anhedral, etc. The planes were launched in a consistent manner from twelve feet and the flight times were recorded. I changed the planes with tabs, winglets, etc. to make the best flight. The planes were again launched using consistent methods and results were compared. Planes with moderate sized wings and with a dihedral around 119 degrees had the best flight.

Project Number: MPH026

Grade: 8

Title: Paintball Pressure

Abstract: This work was intended to determine if the cost of paintballs affects the amount of pressure it will be able to withstand. Four different brands of paintballs were bought, an apparatus was built, weights were put on top of the apparatus while a paintball was inside it, and the amount of pressure it took to pop the paintball was recorded. The least expensive paintball held up the most pressure. Future work may include doing the same project only using paintballs at different temperatures

Project Number: MPH027

Grade: 7

Title: What Bullet Proof Vest Works Best?

Abstract: Many people use bullet proof vests to save their lives. What if that bullet proof vest didn't work? I Sara Mancine wanted to try to make it safer for people who use them. In my project I found out that the Zylon vest is not the best bullet proof vest to use because it let the 40. Caliber bullet through which would mean the person using it would have been either killed or hurt. The Kevlar vest people should use because it stopped every bullet from every gun that we used.

Project Number: MPH028

Grade: 7

Title: Egg Shell Strength

Abstract: The challenge of dropping the egg without breaking the shell is the reason for this experiment. To help find an answer a tester was built to see if the egg shell is stronger at the center middle than at the edges. Five eggs were tested vertically and five eggs were tested horizontally. After testing it showed that the egg shell had more strength at its bottom than its midsection. In future work this experiment results, may help make a covering to prevent the egg from breaking when it is dropped.

Project Number: MPH029

Grade: 8

Title: The Sound of Silence

Abstract: Sound travels throughout the homes of people every day. This work intended to learn what common household materials were the best sound insulators. Five different barriers were placed one at a time between a sound sensor and a sound source. It was determined that sheets of newspaper taped together were the best sound insulators of the five insulators that were tested. Future work is planned to determine if the shape or thickness of the insulator is a factor.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH030

Grade: 7

Title: Can Paper Airplanes Carry Weight?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH031 Grade: 8

Title: Trust and the powers behind it

Abstract: Model rocket and carbon dioxide cars are always fun. But which has more thrust? During my experiment I fired four different sized rocket engines into a load cell. The load cell graphed the thrust on a computer. The same process was repeated for the carbon dioxide model. The model rocket engines had a greater thrust over time and in grams. I could enhance my findings by using cars and spring scales to measure thrust instead of a load cell. I had fun doing this project and would like to expand upon this project in the future.

Project Number: MPH032

Grade: 7

Title: Just Drop It!

Abstract: This work was intended to learn which hockey puck bounced the least. I boiled a puck, froze a puck, and put a puck at room temperature for 4 hours and then dropped the three pucks off the boards at a hockey arena. It was determined that the frozen puck bounced the least and the boiled puck bounced the highest. Future work is planned to test the amount of friction on a frozen puck, boiled puck, and room temperature puck.

Project Number: MPH033

Grade: 8

Title: Sharp or Flat?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH034

Grade: 8

Title: Does Viscosity Affect Boiling Pt.?

Abstract: The atoms of liquids with a high viscosity have a strong bond. Bonds are broken by boiling. An investigation was started to determine if viscosity affects boiling points. Five different liquids were put into pots to boil and boiling points were recorded four times. It was determined that the higher the viscosity of a liquid, the lower its boiling point. Future studies could include the relationship between sugar content and boiling points.

Project Number: MPH035

Grade: 7

Title: The Effect Of Wing Position On The Flight Of A Plane

Abstract: Abstract was not submitted electronically.

Project Number: MPH036

Grade: 7

Title: Impulse of Different Weight Objects

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH037

Grade: 8

Title: Effect Of Color On Light Wave Strength

Abstract: In order to test "The Effects of Color on Light Wave Strength" I prepared a light box that housed a halogen spotlight. Using different colored plexi glass slides, I measured light wave strength of the colors white, yellow, red, green, and blue and introduced the variables rain, fog, day, and night. My results showed that my hypothesis was correct about eighty percent of the time. The light wave strengths in order were as follows: white, yellow, red, blue, and green. I am aware of the purpose behind using different colors of light. The colors of light are used in safety, weather, entertainment, and the medical field.

Project Number: MPH038

Grade: 7

Title: Which Bridge is the Strongest?

Abstract: I built five different bridges from Popsicle sticks: arch bridge, beam bridge, truss bridge, suspension bridge and cable-stayed bridge. I tested the strength of those bridges by varying the distance between the table support and by adding weighted chains to the bridge until it collapsed. I wanted to see which bridge was the strongest. The cable-stayed bridge was the strongest and the truss bridge was the second strongest. All the bridges that spanned a shorter distance could hold more weight. I would like to continue the experiment and use different materials and construction techniques to build a stronger bridge.

Project Number: MPH039

Grade: 7

Title: Most Effective Lubricant

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH040

Grade: 7

Title: Which Car on a Roller Coaster Will Experience The Most G Force?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH041

Grade: 7

Title: Factors affecting bouncing balls

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH042

Grade: 8

Title: Rocketeer

Abstract: I always liked to see rockets being launched. I even launched some model rockets myself. Since I find this fun, I decided to incorporate this into my experiment. For my experiment, I changed the size of a parachute in order to change the weight of the rocket. This is because I planned to find out how weight could affect the flight time of a model rocket. I have found through my experiment that the lightest model rocket had the longest flight time. In the future, I could try this using bigger rockets and more powerful engines.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH043

Grade: 7

Title: The Perfect Lid

Abstract: My project is about making lids land correctly. I dropped lids to create the perfect lid. The perfect lid will always land right and not make a mess.

Project Number: MPH044

Grade: 7

Title: Sliding into Mechanical Separation

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH045

Grade: 8

Title: Spring Into Action

Abstract: The problem is, "can a springboard equalize the height that different weights can bounce?" My hypothesis is, "Yes, a springboard can equalize the height that any weight can bounce." in order to test my hypothesis, I hung a ruler on a wall behind a springboard. I had different weights dropped from the same height onto the springboard and measured how high they bounced by observing the ruler on the wall. I changed the number of springs in the springboard and measured how high each different weight bounced. I concluded that my hypothesis was correct.

Project Number: MPH046

Grade: 8

Title: Solar Energy Absorption

Abstract: The purpose of my experiment was to determine if the shape of solar panels affect the amount of energy absorbed from a radiant light source, simulating the Sun. To test this, I used multiple solar panels, each with a different geometric shape-but identical in surface area. Then I pumped water through plastic tubing attached to the rear of each panel and exposed the panels to a high-intensity light. I exposed each panel to a fixed time duration and measured the initial and final temperatures of the water. I ran multiple trials for each panel and compared my results.

Project Number: MPH047

Grade: 8

Title: The Effects of Moisture and Cold on Soft & Hardwoods

Abstract: Which wood, red oak, poplar, white pine, or southern pine, is best suited for use in the stock of a gun?

Project Number: MPH048

Grade: 8

Title: Springing to Conclusions

Abstract: It was predicted that a spring could be used as a scale to find the mass of a household object. Three different sized springs and objects were obtained. Then spring constant of each spring was established. Next, the household object was hung from the first spring and its expansion was measured. The information gathered from finding the spring constant and the expansion of the spring was used to determine the mass of the household object. Lastly the predicted mass and actual mass of the object was compared and the data was recorded, graphed and analyzed. The process was then repeated for each of the springs and various objects.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH049

Grade: 8

Title: Science in Music

Abstract: If a band is in a parade during the winter, could the cold affect the instruments? This experiment is intended to discover if cold temperatures affect the pitch of musical instruments. Three different instruments were placed outside in cold weather. Later, all three instruments played flat. It was determined that temperature plays a role in the pitch of a musical instrument. My future work will be to continue this experiment to get an average of how much the pitch is affected. This can be helpful to musicians; it can make them aware of how temperamental musical instruments can be.

Project Number: MPH050

Grade: 7

Title: Pully Power

Abstract: The problem is: What is the mechanical advantage of using pulleys to lift weights? My hypothesis is, that with each pulley I add, the weight needed to lift the main weight will be cut in half. I used a main weight of four ounces to be lifted, and added weights on the other side until the main weight went to the top. I performed three tests using 2 single pulleys and 1 compound pulley. My hypothesis was proved wrong, adding pulleys did reduce the weight needed to lift the weight, but it was not reduced by half.

Project Number: MPH051

Grade: 7

Title: Floating on Water

Abstract: When some objects are placed in water they float, while others sink. People, who normally can't float in a swimming pool, float in the Dead Sea. This work is intended to learn what affects buoyancy. Pennies were added to different sized bottles until they sank in tap water. The experiment was repeated in salt water. It was determined that objects floated as long as their density didn't exceed the water density. More pennies were required to sink a similar sized bottle in salt water than in tap water because of the increased density of the salt water.

Project Number: MPH052

Grade: 7

Title: What Reacts Faster L.E.D. or Bulb?

Abstract: Abstract was not submitted electronically. Please visit exhibit floor for abstract.

Project Number: MPH053

Grade: 8

Title: Heat... It Does the Body Good!

Abstract: Many things are used as insulators when it is cold outside. This experiment was to determine which material kept the human body the warmest in cold conditions. Six different materials, that are commonly used while outside, were set into a refrigerator within a jar of 98.6 F water and tested every fifteen minutes to see which one kept the water the warmest. Wool was the best material for holding the heat energy, and hair was the least effective in holding heat energy. Future work is planned to test other materials.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH054

Grade: 7

Title: Footballs and Air Pressure

Abstract: I designed a project to see if the pressure in a football would affect the distance that it can be kicked. My hypothesis is that too little air pressure will decrease the distance; the right amount will go furthest, and too much will decrease the distance. I designed a kicking machine. I filled the football with different pressures, kicked the ball and measured how far it went. I found that the ball traveled farthest when it was filled according to the manufacturer's recommendation. In conclusion, air pressure in a football affects the distance that it travels when kicked.

Project Number: MPH055

Grade: 8

Title: A Study of Aerodynamics

Abstract: This study will address two questions. How does changing the angle of propeller blades affect the efficiency of the propeller and which angle of attack for a propeller is the most efficient? Three R?C airplane 3-bladed propeller blades were purchased. A sealed wind tunnel was created using a plastic tube, a fan that was used on a constant speed, and an anemometer that was used to make sure that the wind speed was kept constant. Seven test groups were created based on the angle tested; 30, 35, 40, 45, 50, 55 and 60 degrees. A string was used to measure the amount of rotations on each test. Each test group was tested 5 times to assure the validity of the results. The data from the experiment was collected, averaged, graphed and analyzed. This study will help to determine the best angle to use for maximum efficiency of propellers.

Project Number: MPH056

Grade: 7

Title: Fabric and Sound

Abstract: My project was to determine which fabrics are the best sound insulators. Three different fabrics: fleece, cotton, and nylon were placed in a wooden box with an alarm, which was set to sound at a specific time. The sound sensor (PAS Port) recorded how many sound decibels escaped the fabric. My results were that the cotton was the best sound insulator.

Project Number: MPH057

Grade: 7

Title: The Effect of Temperature on Pucks

Abstract: I play ice hockey and I have noticed that the pucks react differently from the beginning of practice to the end of practice. The purpose of this investigation was to determine if temperature affects the distance a hockey puck will travel. Ten of each type of puck; heated, room temperature, and frozen, was struck with the same amount of force. The data showed that the heated puck traveled the farther than the other types of pucks. Further testing could include a stronger striking force to simulate a game situation.

Project Number: MPH058

Grade: 8

Title: The Effect of a Mute on the Volume of a Violin

Abstract: I am trying to find out a new material to make a mute that can dampen more sound than a standard rubber mute.

SENIOR DIVISION – PHYSICS