

68th
PITTSBURGH REGIONAL
SCIENCE & ENGINEERING FAIR
March 30 – 31, 2007

INTERMEDIATE
DIVISION
ABSTRACTS



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.	22
COMPUTER SCIENCE/MATH.	33
CONSUMER SCIENCE.	35
EARTH/SPACE/ENVIRONMENT.	46
ENGINEERING/ROBOTICS.	53
MEDICINE/HEALTH/MICROBIOLOGY.	58
PHYSICS.	66
TEAM.	79

Note: Additional projects may have been added after the printing of this book. Omissions should not be considered as a negative reflection on the student or their project.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS001

Grade: 8

Title: Music's Affect on Heart Rate

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS002

Grade: 7

Title: Color vs. Black and White Text

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS003

Grade: 7

Title: How Does Color Effect Learning

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS004

Grade: 8

Title: Kids and Violence

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS005

Grade: 7

Title: Which Type of Music affects How You Shoot Basketball?

Abstract: I did my experiment to see if listening to different types of music would affect the percentage of shots made when shooting a basketball. I tested my seventh grade classmates (11 girls and 16 boys). They shot free throws with no music playing, then with country music, next with rock music, and finally with slow music (5 free throws were shot in each category). I recorded how many shots each person made in each category and then compared their free-throw shooting percentages. I thought rock music would increase performance the most, but found that none of the types had a significant effect.

Project Number: MBS006

Grade: 8

Title: Breakfast affects on school

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS007

Grade: 7

Title: NHL Home Field Advantage

Abstract: My project was about how home field advantage may affect the home NHL team wins. The purpose was to find out if home field advantage affects the home team winning. My hypothesis was if a home team plays an away team, then the home team will win, because they may have more confidence because of the fans, the referees, knowing the arena well, or not traveling. I chose to do this experiment from October 4th, 2006-November 22nd, 2006 (a total of fifty days). I found out that fifty-four percent of the home teams beat the away teams.

Project Number: MBS008

Grade: 7

Title: Rock The Heart Beat

Abstract: This project interests me because I enjoy music and I wondered what affects it would have on the body. I gathered boy and girl volunteers, seated them comfortably in a chair, placed headphones on their heads, and had them listen to different categories of music and recorded changes to their heart rate through a heart monitor. I was pleased with the different results that I encountered. I saw definite changes with the subjects I monitored. By the end of my experiment, I was able to tell which music categories caused the most and least heart rate changes.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS009

Grade: 8

Title: Is Handedness Genetically Determined From Parent to Child?

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS010

Grade: 8

Title: An Eye for Color

Abstract: How will the contrast or similarities of a target and its background affect acuity? It was hypothesized that greater visual acuity will occur when subjects view targets and backgrounds of contrasting colors and that yellow and black would provide the greatest contrast. Twenty subjects were tested using 56 cards with two lines, 1.6 mm apart. The distance at which the subject could correctly identify two lines, and the color of the lines, was recorded. The results showed that subjects identified orange on black at the farthest distance, followed by white on blue. The hypothesis was partially supported by the results in that yellow on black was one of several color combinations that provided the best acuity. This research could possibly be useful in the construction of flyers and signs of all types, including advertisements and Department of Transportation signs for motor vehicles.

Project Number: MBS011

Grade: 8

Title: Which Types of Music Neg. Affect Performance?

Abstract: The purpose was to see what types of music affect performance. The data for my hypothesis came from volunteers I took for testing. My subjects were from my own school where they were tested. After setting up, they placed headphones on to block out minor noises and for them to hear music. After explaining what we'd do, I handed 1 of 4 word searches of one level and assigned 3 words. Nothing was used twice with one subject, preventing uncontrollable variables. Listening to music, the searching task was timed. At the end, another question came: does music overall affect performance?

Project Number: MBS012

Grade: 8

Title: Lack Of Sleep

Abstract: We would like to see how lack of sleep effects someone's behavior. So we asked one of our friend's if he would stay up for a certain amount of time to see how lack of sleep effects his behavior. Solomon will stay up for 45 hours. We will be monitoring his conductivity for the next 45 hours that he is up for. Since he can't stay at any of our houses we will be talking to him on the phone. He's not allowed to have any sugar products either. When Solomon is up for the 45 hours he will also be keeping a journal that he will be writing in every two hours. To see how his behavior has changed in that amount of time

Project Number: MBS013

Grade: 8

Title: Pitch'ure Perfect

Abstract: Pitch is the perceived fundamental frequency of a sound. Have you ever wondered what percentage of the population can sing on pitch? A pitch pipe and chromatic tuner was used to determine this. A note E was played on the pitch pipe and 100 participants were asked to sing this note into the chromatic tuner. According to the data, the majority of males with or without musical background sang on pitch or sang flat. The majority of females with musical background sang on pitch or sang sharp. Finally, the majority of females without musical background sang flat.

Project Number: MBS014

Grade: 8

Title: Talking Hands

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS015

Grade: 7

Title: Can You Remember 10 Letters?

Abstract: What I did in my experiment was, I took 40 people total and I would see if they could remember 10 letters in 10 seconds. I took a subject and I showed them a piece of paper with 10 random letters on it for 10 seconds. After 10 seconds was up I took the piece of paper away from them and they would have to say the letters back to me in order. As they were telling me the 10 letters I would record how many letters they missed and how many letters they got right.

Project Number: MBS016

Grade: 7

Title: What Paw Is Favored?

Abstract: The purpose of this experiment is to determine if cats can have a specified part of the brain. The first procedure that I did was a swatting test, followed by the clawing test, and the ice cube test. Of the seven cats I tested, I found that five out of seven cats seemed to favor their right paw over their left. My hypothesis was correct, because I stated that since a majority of people are right handed, I thought cats would favor their right paw over their left. Therefore, my data supported my hypothesis greatly.

Project Number: MBS017

Grade: 8

Title: Memory Challenge

Abstract: Do boys have better memories than girls or is it the other way around? This is the problem that the investigators will soon figure out in this team project. To solve this problem, the investigators will first gather 25 materials and put them onto a tray and select thirty subjects; fifteen male and fifteen female. Next the investigator will retrieve one test subject and explain the rules. All 25 materials on the tray are placed in a quiet room in a random arrangement. The subject will then come into the room and look at the objects for 30 seconds. Immediately after the subject has looked at the objects, the investigator will hand the subject a notebook and a pencil and have the subject write down everything they remember for 3 minutes and 30 seconds. The investigator will then do this entire procedure 29 more times with different subjects (15 male, 15 female).

Project Number: MBS018

Grade: 8

Title: Don't Distract the Driver

Abstract: I am doing this project because I frequently see people, especially teenagers, driving while using cell phones, eating, talking to friends, or listening to loud music. The result of my experiment was that the distraction that caused the most problems for the teenage driver was having friends in the car. My results support that my hypothesis was correct.

Project Number: MBS019

Grade: 8

Title: Bait Preferences of Bass

Abstract: What kind of bait do Largemouth Bass prefer? It was the experimenter's hypothesis that bass would prefer live bait to artificial baits and lures. Several different lures were tested: crank bait, spinner bait, plastic worms, jointed crank bait, bait fish, and worms. Each type of bait was cast ten times in the same manner across a large tank containing 22 Largemouth Bass. The number of fish attracted to each bait was recorded. The results showed that the artificial baits out-performed the live baits. The jointed crank bait did the best of all the baits. The jointed crank bait showed the most movement through the water, which probably attracted the most fish. The hypothesis was incorrect.

Project Number: MBS020

Grade: 7

Title: Do Sunglasses Affect Batting Ability?

Abstract: Sunglasses are useful in sports both to protect the eye from injury and from the ultraviolet rays of the sun. This experiment was intended to discover if sunglasses affect a baseball player's batting performance. It was hypothesized that baseball sunglasses would improve batting performance, while

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

ordinary sunglasses would not. Three types of glasses were tested on twelve baseball players at a batting cage: clear lenses, ordinary sunglasses, and baseball sunglasses. Hits, misses and foul balls were tallied. The results showed that ordinary sunglasses performed the best, while clear lenses performed the worst. This may have been due to the fact that most of the players were not accustomed to baseball sunglasses. This investigation showed the hypothesis to be incorrect.

Project Number: MBS021

Grade: 7

Title: The Effects of Color on Memory Retention of Items on a List

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS022

Grade: 8

Title: Pick A Card, Any Card

Abstract: Does gender affect the probability of picking the same card? A deck of cards was ordered in a specific pattern. Twenty-five male and twenty-five female participants each picked five cards randomly from the ordered deck. The deck was placed back in order prior to each participant picking cards. The cards the participants chose and comments made were recorded. The data showed gender does not affect the probability of picking the same cards.

Project Number: MBS023

Grade: 8

Title: Memory Challenge

Abstract: Do boys have better memories than girls or is it the other way around? This is the problem that the investigators will soon figure out in this team project. To solve this problem, the investigators will first gather 25 materials and put them onto a tray and select thirty subjects; fifteen male and fifteen female. Next the investigator will retrieve one test subject and explain the rules. All 25 materials on the tray are placed in a quiet room in a random arrangement. The subject will then come into the room and look at the objects for 30 seconds. Immediately after the subject has looked at the objects, the investigator will hand the subject a notebook and a pencil and have the subject write down everything they remember for 3 minutes and 30 seconds. The investigator will then do this entire procedure 29 more times with different subjects (15 male, 15 female).

Project Number: MBS024

Grade: 8

Title: Music To My Eyes

Abstract: The purpose of this experiment is to find out if music affects hand-eye coordination. The results of this experiment could benefit individuals recovering from strokes, assembly line workers, or students with neurological and fine motor deficits.

Project Number: MBS025

Grade: 8

Title: Changing Handwriting

Abstract: Does an individual's handwriting change over two years? Twenty students previously tested in sixth grade identified their completed old handwriting tests and were given a new handwriting test. After each student completed the test, the same teacher graded the test on a scale from 0-3 (0-uncompleted, 1-poor, 2-average, and 3-excellent). After the new handwriting tests were graded, the scores were compared from the previous tests. According to the data, the majority of the student's had handwriting that worsened over the past two years. Handwriting may have worsened because of increased use of computers.

Project Number: MBS026

Grade: 8

Title: Reaction Action

Abstract: How does one person's influence affect another's reaction? Fifty male and fifty female subjects were exposed to a 2 minute conversation that included a cough, yawn, snuffle, and arm scratch. Data collected recorded the type of reaction and the number of times for the reaction by the participants. The

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

conversation was conducted every time by the experimenter using a script. According to the data, a yawn was the most common reaction among both males and females. While some had no reaction at all, more females reacted to the influences in the conversations than males.

Project Number: MBS027

Grade: 8

Title: Subliminal Messages

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS028

Grade: 8

Title: At What Point Does Peripheral Vision Stop?

Abstract: Peripheral vision is needed to do every day tasks. This experiment was done to determine whether or not eye color affected peripheral vision. Shapes and colors were slid along the edge of a semi circle with angles marked on it. The angle at which an object could first be seen was then recorded. It was concluded that people with blue eyes have the best peripheral vision. Future experiments would include, determining if glasses or contacts had any affect on peripheral vision, or the affect of age on peripheral vision.

Project Number: MBS029

Grade: 7

Title: Do You Feel It Now ?

Abstract: To determine which touch receptors are most sensitive. I tested 20 Sixth and Seventh Graders, 10 boys and 10 girls, touch receptors. I am marking a dot, with a brush pen, on the subject's cheek, mid-forearm, tip of thumb, and back of mid-calf. Then the subject will try to match the dot as close as they can, without looking, by using a different color brush pen. I will measure, with a caliper, the distance between the two dots. The thumb was the most sensitive.

Project Number: MBS030

Grade: 8

Title: Touchy Feely Tactile Sense Testing

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS031

Grade: 7

Title: Mnemonics and Memorization Skills

Abstract: An experiment was designed and conducted to see if mnemonics improve memorization. Students were selected and given 15 items to memorize, in various trials controlled to isolate the impacts of mnemonics. The students improved their test scores when the mnemonic was teacher-generated, and decreased their test scores when the mnemonic was self-generated. This research may help teachers develop lessons that are more easily retained by students.

Project Number: MBS032

Grade: 7

Title: The Effects of DDR on Coordination

Abstract: The purpose of this experiment was to test if Dance, Dance, Revolution video game can improve your coordination. Ten subjects were split into 5 groups of two. The groups were pre-tested to find their starting levels. They were also pre-tested for eye-hand coordination. Each group played the game everyday for an assigned amount of time. After each week they took a test to see if their eye-hand coordination improved. After a month a final test was given. The final test showed that the overall amount of their eye-hand coordination levels had improved.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS033

Grade: 7

Title: What Color Makes You Shine Bright

Abstract: The purpose of this experiment was to determine if a person's complexion affects their color preference. People were shown different paint sample strips with the same color but different color saturation (light to dark). Their preferences were recorded along with their complexion type. It was found that complexion does seem to affect preference of color with lighter complected people choosing lighter color samples.

Project Number: MBS034

Grade: 7

Title: Stroop Effect and Perception

Abstract: The Stroop Effect is a task in which people are asked to state a written color word and not the font the word is written in. For this project I tested multiple subjects using a Stroop chart to see how many color words would be identified correctly without saying the font color. I repeated the tests again with a black font chart instead of a chart with color font. After completing this experiment I concluded the following results, more people identified color words incorrectly on the different colored chart then the black chart.

Project Number: MBS035

Grade: 7

Title: To Chew or Not to Chew?

Abstract: The purpose is to determine if students will have better test scores while chewing gum. The procedures are as follows: I gave the students a permission slip to take home and get signed. Then, I gave all a test to take without gum. Next, I gave them the same test to finish while chewing gum. Finally I recorded the results. The students did better with the gum than without. My hypothesis was correct; the students did better with the gum than without.

Project Number: MBS036

Grade: 8

Title: Stop!

Abstract: Randomly watching cars not stop at stop signs made me curious about how many people do this. The hypothesis is if at least thirty people driving vehicles approach a stop sign, then 50% of the drivers will come to a complete stop. Making a survey sheet and waiting at the two stop sign locations, I watched thirty cars at three trials of each location. The hypothesis was proven wrong, because only 13% of the cars stopped of an average of all the trials put together. That average showed that 37% cars yielded, 7% stopped because of traffic, and 43% did not stop at all.

Project Number: MBS037

Grade: 8

Title: Now You See It Now You Don't

Abstract: My project was on chromatic adaptations. My question was "How quickly do your eyes adapt to the chromatic adaptations?" My hypothesis was "I hypothesize that ypur eyes will adapt quickly". My materials are: computer colored printer, volunteers, stopwatch, and the internet. My procedure was to gather my materials. Position the image in a well lit location. Make sure the image is eye level. Look at the image of the pontoon plane; ypu will notice the right side has a yellowish tint and left side has a bluish tint. Look at the dot with the blue and yellow rectangles for 8 seconds. It's ok to blink. Switch to the bottom picture, you will start to notice that the portions of the plane are the same color. Use stopwatch to record time of how long it takes for the color differences to reappear. Repeat with other volunteers. Record and graph data. My conclusion is my hypothesis was proven correct. 4 out of 5 people's eyes adapted quickly to the color change.

Project Number: MBS038

Grade: 8

Title: Effects of Music on Blood Pressure

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS039

Grade: 8

Title: Which Gender Is In Its Right Mind?

Abstract: My experiment was done to prove that girls are more right-brained than boys and that boys are more left-brained than girls. I tested eighty children between the ages of 11 and 14 (forty girls and forty boys). I printed my test from www.blogthings.com and passed it out to my subjects. Subjects read the questions and filled in the answer for each question that best described them. After I collected the tests, they were scored on the website to see if they were more right- or left-brained. My results proved my hypothesis correct for the youngest subjects, but not the older subjects.

Project Number: MBS040

Grade: 8

Title: Lack Of Sleep

Abstract: We would like to see how lack of sleep effects someone's behavior. So we asked one of our friend's if he would stay up for a certain amount of time to see how lack of sleep effects his behavior. Solomon will stay up for 45 hours. We will be monitoring his conductivity for the next 45 hours that he is up for. Since he can't stay at any of our houses we will be talking to him on the phone. He's not allowed to have any sugar products either. When Solomon is up for the 45 hours he will also be keeping a journal that he will be writing in every two hours. To see how his behavior has changed in that amount of time

Project Number: MBS041

Grade: 8

Title: Do Cell Phones Distract?

Abstract: The purpose of this experiment was to see if cell phone use affects how well a person performs a task. Fifteen adults and fifteen children were asked to learn to play a computer game. Then, all subjects played the game without using a cell phone (control) and again while using a cell phone (answering questions from a prepared script.) Game scores and the number of questions answered right and wrong were recorded. The data showed a decrease in all the game scores when subjects used a cell phone. The conclusion was that cell phone use distracts people from tasks.

Project Number: MBS042

Grade: 8

Title: Do You Remember?

Abstract: The purpose of this experiment is to determine if people can retain more items in their short-term memory if items are grouped by category than when items are grouped randomly. Subjects were given forty-five seconds to study a page with twelve pictures then forty-five seconds to list the items remembered. This process was repeated for a second form. The experimental group viewed a random form then a grouped form. The control groups saw two random or two grouped forms. Results were analyzed. Subjects were able to remember more items when the items were in grouped order rather than random order.

Project Number: MBS043

Grade: 8

Title: Lack Of Sleep

Abstract: We would like to see how lack of sleep effects someone's behavior. So we asked one of our friend's if he would stay up for a certain amount of time to see how lack of sleep effects his behavior. Solomon will stay up for 45 hours. We will be monitoring his conductivity for the next 45 hours that he is up for. Since he can't stay at any of our houses we will be talking to him on the phone. He's not allowed to have any sugar products either. When Solomon is up for the 45 hours he will also be keeping a journal that he will be writing in every two hours. To see how his behavior has changed in that amount of time

Project Number: MBS044

Grade: 8

Title: Which Color is Seen Easist in Traffic?

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Project Number: MBS045

Grade: 8

Title: Astrology and Career

Abstract: Please visit exhibit for student's abstract.

Project Number: MBS046

Grade: 8

Title: Hand Dominance and Brain Lateralization

Abstract: Handedness is defined as the unequal distribution of fine motor skill between the left and right hands. Some studies have shown a relationship between handedness and brain lateralization. Knowing this, I thought it would be interesting to conduct a study to see if being right or left handed affected the way subjects viewed optical illusions. To do this, I had fifteen left handed subjects and fifteen right handed subjects view four optical illusions. My data showed that the left handed subjects did better than the right handed subjects, but there was not enough information to make a complete conclusion. Further research revealed that we simply don't understand enough about cerebral dominance, brain lateralization, the causes and effects of left/mixed handedness, and how these things interact, to be able to make blanket statements. This researcher has concluded that using illusions to determine handedness and brain dominance is too simplistic to determine such a complex relationship. I have also learned that there are many conflicting beliefs and standards for testing handedness. Finally, the research on brain dominance is ongoing, and further study is much needed in this field.

Project Number: MBS047

Grade: 7

Title: Diving Under Pressure

Abstract: The purpose of my experiment is to understand what variables affect air consumption in SCUBA divers. My hypothesis is that air consumption will be unaffected in experienced SCUBA divers after testing common problems in a simulated dive environment. Nine divers performed five dives (resting, swim, no mask, blindfold, and Rubik's cube) of five minutes duration. Air gauges were recorded after each dive. The no mask, blindfold, and Rubik's cube dives showed no significant difference in air consumption. During the swim, air consumption was doubled. In conclusion, I learned that only exertion should affect air consumption in SCUBA divers.

Project Number: MBS048

Grade: 7

Title: Does Cell Phone Use Affect Driving Skills?

Abstract: I hypothesized that if a person drives a car while talking on a cell phone, then their driving skills will decrease because of the distraction. A video game with car-like steering wheel and pedals was used to create a safe driving simulation course. Fifty licensed drivers ran the course three times: once to learn the controls, once without using a cell phone, and once while talking on a cell phone. The time to finish the course was recorded for the last two runs. I found that on average subjects finished the course faster while using the cell phone.

Project Number: MBS049

Grade: 8

Title: Decisions 2007

Abstract: How does person's political affiliation affect how they judge a political statement? A survey was created for one hundred subjects over the age of eighteen with a political editorial statement concerning the environment. The survey asked whether or not the subject agreed or disagreed with the view of President Bush's administration. The data collected included age, gender, political affiliation, and educational background to determine if these variables affected a person's political decision. According to the data collected, more republicans disagreed with their affiliation than Democrats. The data also showed that people with more education stayed with their political affiliation.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI001

Grade: 8

Title: Do Outside Effects On Drivers Effect Their Reaction Time?

Abstract: I did this experiment to see how dangerous it can be for drivers to drive with distractions. I had one subject sit in a car at a time. The subject would then watch a power point of a road. A deer would run in the middle of the road. The subject would slam the brakes as soon as they saw the deer. I recorded their times with a stopwatch. I learned that talking on the cell phone gives you a chance of having your reaction time lowered. Sometimes the radio helped the reaction time. The drivers looking up at the mirrors had their reaction time slowed.

Project Number: MBI002

Grade: 8

Title: Electromagnetism & Euglena

Abstract: Do electromagnetic fields change the behavioral movements of protists? An electromagnet was made with one wire, one nail, and a six-volt battery. Then it was applied to a well slide containing one drop of a culture of Euglena by placing the end of the nail to the left area of the slide. Flagellate protozoans of the species Euglena were then studied to watch for any reactions. After carefully studying the organisms, the investigator found that electromagnetic fields do affect the movement of protists. Further research showed that the term taxis is a response to a stimulus, and that the term "galvanotaxis" refers to the response of the organism to the electrical current, in this case produced by the electromagnet. The investigator believed that the electromagnet fields had an effect because migratory animals use magnetic fields around the Earth as a "compass" to guide them on their journeys.

Project Number: MBI003

Grade: 7

Title: What is Important Factor in Fertilizer

Abstract: The purpose of my experiment was to find the most important factor in fertilizer. To get my results, I first placed equal amounts of soil, grass, and water. After that, I put Nitrogen and Phosphorous, Phosphorous and Potassium, Potassium and Nitrogen, nothing, and a combination in separate containers. After the experiment, I discovered that the combination was the most effective. However the control did do better, I think that the Combination did better because it didn't yellow throughout the experiment. From my data I saw that the Control grew the tallest and germinated fastest, but didn't look the best.

Project Number: MBI004

Grade: 8

Title: The Visual Degradation of DNA

Abstract: How drastic is the visual change in DNA when placed in freezing, hot, and regular room temperatures? The purpose of this experiment was to see how drastic the change in DNA was during a twelve hour period in 3 different environments. The experimenter's hypothesis was that the DNA would degrade the most in the hot temperatures while staying the same in the freezing environment and barely changing at regular room temperatures. The DNA was first extracted from an onion and then placed in the different environments. Every two hours for a twelve hour period it was measured in millimeters. The end results for this experiment turned out similar to the experimenter's hypothesis, which proves that the best way to store DNA is in freezing temperatures.

Project Number: MBI005

Grade: 7

Title: N Preservatives vs Refrigeration

Abstract: Is to compare the use of natural preservatives to modern refrigeration and which natural preservative will work the best in preserving bread from mold vs. the refrigerator.

Project Number: MBI006

Grade: 7

Title: Pollution Study of Raccoon Creek

Abstract: The purpose of this experiment is to determine whether or not Raccoon Creek is polluted. If it is polluted, what is its most abundant pollutant? The idea for the experiment came from Raccoon Creek

INTERMEDIATE DIVISION – BIOLOGY

looking polluted and dirty. The hypothesis is if Raccoon Creek is polluted, then the benthos will show this because they are a good indication of water quality. Raccoon Creek is polluted, and its main pollutant that could be identified is iron. This conclusion is well supported by the benthic invertebrates and chemical data.

Project Number: MBI007

Grade: 7

Title: The Gecko Molting Cycle

Abstract: The Leopard Gecko eats little or nothing while shedding its skin. My project was to observe and determine whether the Gecko uses the fat stored in its tail during the molting process and then increases its food intake to rebuild its reserves, or whether the Gecko senses the coming molting and increases its food intake beforehand. I carefully weighed and recorded the amount of food the Gecko ate over the course of three molting cycles. I discovered that the Leopard Gecko dramatically increases its intake of food just before and after the molting process, confirming my hypothesis.

Project Number: MBI008

Grade: 8

Title: Carbon Dioxide Output

Abstract: Do the carbon dioxide levels vary between teens who participate in sports and teens that do not participate in sports before and after physical activity? Ten females and males were tested before and after some type of physical activity. Choices for activities included fast walk, slow walk, jog, sprint, and skip. Exhaled carbon dioxide levels, were determined using a homemade respirometer. According to the data, the slower activities took longer to change the color of the pH solution in the respirometer than faster activities.

Project Number: MBI009

Grade: 7

Title: Which Soil Will Grow Beans?

Abstract: Lima beans are one type of many beans in the world that we grow to use as food. Soil provides the beans nutrients for their proper growth. This project compared the growth of lima beans in four types of soil; wood chips, peat moss, potting soil and ground soil. Their growth was observed and measured for one month. The project hypothesis, that potting soil would help lima beans grow the fastest, was proven wrong. Ground soil helped lima beans grow the fastest. So farmers would want to use ground soil to grow their lima bean crops.

Project Number: MBI010

Grade: 7

Title: Maximizing Hydroponic Growth With Light and Temperature

Abstract: This project investigates the growth of plants in a hydroponic system. The question asked is: What amount of light and what temperature will produce the best growing environment? Seeds will be placed on cheesecloth squares and massed initially. Samples will be divided into groups, and after exposure to different amounts of light and different temperatures, data will collected when samples are massed again.

Project Number: MBI011

Grade: 8

Title: Triple Threat Match

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI012

Grade: 8

Title: The effects of varying types of music on heart rate

Abstract: My experiment investigates how much music effects a human's heart rate. Participants will listen to varying types of music. These were alternative, classic rock, hip hop, metal, and classical. After listening to the song for exactly three minutes, subjects will have their heart rate recorded. my prediction is that metal will effect heart rate the most and classical will have little or no effect on heart rate. This will then be compared to their resting heart rate

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI013

Grade: 8

Title: And Then There Was Light

Abstract: Everyone knows that plants need light to grow, but does it have to be from the sun? This experiment was to determine the effect of artificial light on wild flowers. Two sets of plants were set out, one under a grow light, the other in a window to absorb the natural sunlight. I have concluded that for wild flowers artificial light works better than the sunlight. In the future, I could also try and determine whether the artificial light has the same effect on vegetables or some other types of plants.

Project Number: MBI014

Grade: 8

Title: Glow With The Flow

Abstract: Bioluminescence is the production of light by living organisms thru an internal chemical reaction. This simple reaction is generated when luciferin is joined with luciferase in the presence of oxygen to create the "cold light" of bioluminescence. Pyrocystis bioluminescence is set by a biological clock, just like our sleep rhythms. At night, the cells produce the chemicals needed for the chemical reaction, and during the day the Pyrocystis cells photosynthesize using the light energy they receive. The investigator developed an experiment to study how altering the day/ night phases of dinoflagellates would affect their cell structure, thus affecting their ability to bioluminescence. After controlling their circadian rhythms, four variable groups that received no light, all light, 6 hours of light, 18 hours of light, and a control group given 12 hours of light were put under a fluorescent light for their respective amounts of time. While observing these cells under a 400X microscope, the investigator closely analyzed the entire cell structure of each dino and rated each cells chloroplast distribution on a scale of 1- 5. It was concluded that while each variable and control group responded differently to the amount of light/ dark they received, all groups were ultimately able to adapt to the change in their day/ night phases. The investigator conjectured that if the ability of Pyrocystis to adapt could be evidenced, that further practical applications use for bioluminescence could be applied in the military, medical, commercial and industrial design fields.

Project Number: MBI015

Grade: 8

Title: Who Will Win The Crown? Beta Carotene or Crown Gall

Abstract: Human diseases are well - known. Plant diseases on the other hand are not. Crown Gall is one of these plant diseases. The worked performed in this experiment is intended to show Beta Carotene's effect on apple trees with Crown Gall by watering it with a Beta Carotene solution. Physical changes were recorded and photographed at the end of each week. The tumor - like figures started to harden, stopped growing, and no new tumors appeared. A future experiment is planned in the summer to see if the plants metabolism and air temperature make a difference in this experiment.

Project Number: MBI016

Grade: 7

Title: Caffeine/Blood Pressure

Abstract: The problem is, "Will caffeine raise your blood pressure?"

It is hypothesized that drinking coffee or Coca-Cola will raise your blood pressure. A breif procedure of the experiment is as follows. I will test my family members blood pressure drinking Coca-Cola or coffee throughout the day. I test it five minutes before they drink it, then a half an hour later. During this time, I record my data. The results do support the hypothesis.

Project Number: MBI017

Grade: 8

Title: House of Horrors

Abstract: The purpose of my expeiment was to determine which room is the common household would have the least bacterial growth when cultured. My procedure was as follows: 1.Mix nutrient agar with water in pot 2.Place over heat source and bring to boil 3.Remove and cool for 1 minute 4.Distributeinto petri dishes 5.Culture once set 6.Dip swab in water and swab desired object 7.Place tips in dishes and let culture. My data proved that no matter how clean you keep your home, bacteria is everywhere. In conclusion, my hypothesis, my belief of the bathroom being the least germ infested room in my house of testomg, was correct.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI018

Grade: 7

Title: The Effect of Vitamins on Plants

Abstract: The purpose is to determine how vitamins affect plants growth. Vitamins C, B1, B6, and B12 were tested. 100 cups were planted with one seed in each. Solutions were prepared with 100mg vitamin tablets into separate 500 ml bottles. Cup with seeds were given 15 ml of the appropriate solution daily. The cup were covered with plastic wrap and placed under a plant light for 12 hours daily. The heights of the plants were averaged. The plants given vitamin c grew the tallest, but the plants given B vitamins didn't grow as tall as the control group.

Project Number: MBI019

Grade: 7

Title: How to Keep Apples From Browning

Abstract: The purpose of my experiment was to determine which substance keeps apples from browning the longest. I used 5 different household substances and soaked apples slices for ten minutes in each substance. I then monitored the slices in thirty minute intervals for 5 hours using transparent graph paper to count the number of blocks of browning. Vinegar showed the most amount of browning and salt and water showed the least. However, salt and water also altered the taste. I concluded that lemon juice was the best solution for least amount of browning and no affect on flavor.

Project Number: MBI020

Grade: 8

Title: Memory Recall According to Age

Abstract: The purpose was to determine if one age group remembers more. Ten subjects in three different age groups participated. Fifteen items were placed on a tray. Subject looked at tray for 60 seconds. Tray was then removed. Subject wrote down what they remembered from the tray. Subject's name, items remembered, and age was recorded. Out of a total score of 150, data resulted in the preteen group remembering 100 items; 18-28 group 106; 45-55 group 91. Conclusion showed hypothesis was supported by data. All groups' results were similar because short-term memory only holds small pieces of information at a time.

Project Number: MBI021

Grade: 8

Title: Protect The Skin You're In

Abstract: My project was done to see if higher SPF sunscreens offer better sun protection. The outcome provided results about SPF in major sunscreen brands. I put SPF 30 sunscreens on solar beads and recorded time before burning under a UVB bulb's light, and repeated with SPF 15 and 50. The results showed that higher SPF sunscreens last longer. The brand that worked the best was Coppertone, followed by Banana Boat, then Hawaiian Tropic. My hypothesis, that the SPF is as promised, was supported. If I were to repeat this project, I could test generic brands and change the bulb's heat.

Project Number: MBI022

Grade: 7

Title: How Does Detergent Affect Chia Pets?

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI023

Grade: 7

Title: Eww. . . Bacteria

Abstract: The purpose of my experiment was to see which disinfectant killed more bacteria on your hands. I grew bacteria overnight on a cutting board smeared with lunch meat. I used petri dishes to count the bacterial colonies. The hand soap killed most of the germs. If I was to re-do my experiment I would do more trials so my results were accurate. I would also use more disinfectants.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI024

Grade: 7

Title: Effects of Acid Rain on Brine Shrimp

Abstract: The purpose of this investigation was to determine how long it would take for acid rain to kill an organism. Vinegar was added to one jar with water and brine shrimp and labeled Experiment, and the other, labeled control, contained water and brine shrimp. Three trials were done. By Day 2, all shrimp in the experimental jar died because brine shrimp cannot live in an acidic environment.

Project Number: MBI025

Grade: 7

Title: Bubble Germs

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI026

Grade: 8

Title: Salty Shrimp

Abstract: For my project, I wanted to see which solution of salt water would help Brine Shrimp eggs grow the best. I had solutions with 0%, 20%, 40%, 60%, 80%, and 100% salt water. I observed the eggs for 10 days to see which solution would hatch the most eggs.

Project Number: MBI027

Grade: 7

Title: Beautiful Bacteria

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI028

Grade: 8

Title: The effect of contact lens solution on ster. bac.

Abstract: The purpose of my project was to find what type of four contact lens solutions would kill bacteria the best. I had contact issues in the past so I was interested to find what solution would help my irritation. I used 2 store brand and 2 homemade solutions, Exchange Multi-purpose, ReNu Multi-Plus, Salicylic Acid and Saline. I swabbed my mouth with a Q-tip, dipped it into a solution and then swiped it onto a Petri Dish. I observed the growth over 72 hours and the Exchange was the most effective, the Saline the least.

Project Number: MBI029

Grade: 8

Title: To See or Not to See

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI030

Grade: 8

Title: The Effects of Colored Lights on Plants

Abstract: The purpose of this experiment was to test the effect of red, blue, green, and yellow light on pea plant growth. These different colored lights were exposed to growing pea plants over a 4 week span. The pea plants exposed to red light grew the greatest. This experiment could benefit agricultural engineers.

Project Number: MBI031

Grade: 8

Title: Fine Motor Coordination

Abstract: The purpose of this experiment was to find out which gender had the fastest and more accurate fine motor skills. People who would benefit from the results of this test would be employers seeking workers for jobs that require fine motor skills.

Project Number: MBI032

Grade: 8

INTERMEDIATE DIVISION – BIOLOGY

Title: Print Me

Abstract: The goal of my experiment was to see if offsprings' fingerprints are inherited from the parents. To do this I tested two families. After printing them I observed my data to find that most of the offsprings' types of fingerprints did show up in their parent's data on the same finger and hand. Although this may seem conclusive I decided that with such a small group of data I could not find a true answer

Project Number: MBI033

Grade: 7

Title: What a Beat

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI034

Grade: 7

Title: Does pH affect seed germination?

Abstract: My experiment is "Does pH affect seed germination?" I conducted it because people want to know what the perfect pH is for plants. First, I gathered my materials. I mixed five different pH solutions and placed them into a container. I measured the pH. I put ten seeds into each container and let them sit for 24 hours. I put the seeds into another container with 100 mL for five days. I checked for germination twice a day. Water was the only solution where seeds germinated. I ran the test four times. I concluded that pH does affect seed germination.

Project Number: MBI035

Grade: 8

Title: A Rocky Start

Abstract: The topic of my project is hydroponics. There are two different ways to grow plants using hydroponic method. There is the solution culture and the medium culture. In the solution culture, plants are suspended while water is rushed over them. In the medium culture version, plants are grown with their roots in the mineral solution. To support the roots, the plants are placed in mediums such as: perlite, peat, vermiculite, gravel, rockwool, etc. I decided to test my project using the medium culture version. My question is: Do hydroponic plants grow differently in different hydroponic mediums? I chose vermiculite, gravel, glass beads, and styrofoam packing peanuts for my mediums. Soil is my control group. I purchased Kentucky Wonder green bean seeds and placed 30 under a damp paper towel. I allowed several days for the beans to germinate. I placed 2 beans in each of my mediums. I used 2 pots filled with each medium. I performed a second planting 10 days after my initial planting. I watered the beans 3 times a day everyday. After the first few days, I noticed differences in the plants growth patterns. The vermiculite and styrofoam trials were lacking support, but the leaves were larger than those of the gravel or marble mediums. When I performed an autopsy on the plants, the roots of the vermiculite had the poorest appearance of all the trials. The gravel had the healthiest appearance. Out of all the mediums, the gravel trial did the best. My hypothesis was proven correct.

Project Number: MBI036

Grade: 7

Title: Which Fly Repellent Works the Best to Prevent Flies from Infesting Horses' Bodies?

Abstract: Flies and other insects are harmful to horses. This experiment is intended to show which fly repellent is most effective. Nine horses were divided into three groups. Group A had vinegar applied to their food. Group B had fabric softener applied to their face and legs. Group C had Bronco fly spray applied to their face and legs. Group A was fed daily. Groups B and C had the product applied twice a day. The number of flies was recorded on a daily basis for thirty days. It was proven that in the end the vinegar repelled the most flies.

Project Number: MBI037

Grade: 8

Title: Do Vocal Warm-ups Work?

Abstract: Permission slips were obtained for the ten subjects. The pianist played a note while each subject stood and sang the note for as long as possible. The note held before the warm-up was timed and recorded.

INTERMEDIATE DIVISION – BIOLOGY

The pianist played the warm-up music for one, three, and five minutes while the subject sang the warm-up for each amount of time. Steps two through five were repeated for each subject three more times. These subjects were students of my voice teacher recruited to help in the investigation. There were no risks or physical activities during this investigation.

Project Number: MBI038

Grade: 8

Title: Bean Growth

Abstract: The purpose of my experiment was to determine what type of bean undergoes the process of germination the fastest. To do this, I planted five different types of bean seeds and recorded daily growth for 16 days. My results showed that the fastest overall average growth was the Pinto bean. I concluded my experiment by stating that my original hypothesis was incorrect and by connecting my results to the fact that pinto beans are the fastest growing beans in the United States. This may be important if discussing the need for more food to be produced for an ever increasing world population.

Project Number: MBI039

Grade: 7

Title: Effects of 2nd Hand Smoke on Worms

Abstract: This experiment was conducted to see if smoke from different types of cigarettes would affect the mass of red worms. Worms were divided into 4 groups with 75 worms per group. Group #1 was the control group and #2-4 were exposed to regular, menthol, and "light" cigarette smoke. Mass was recorded before and after testing. Daily for two weeks a cigarette was attached to an aquarium pump to simulate smoking. Worms were exposed to second-hand smoke in a fume hood for 5 minutes. The worms exposed to the smoke lost mass at about the same rate.

Project Number: MBI040

Grade: 8

Title: Blemish Banishers

Abstract: Acne is a problem in many adolescent and adults. This work is intended to learn what type of acne medications works the best. Acne medications were used on a culture of Propionbacterium acne to determine which one had the most effect. It was determined that the antibiotic had more of an effect on the acne. In conclusion it is proven that antibiotic medications had more effect than the over the counter medications. Future work is planned to determine if the antibiotic medications are still most effective against any of the other acne medications.

Project Number: MBI040

Grade: 8

Title: Blemish Banishers

Abstract: Acne is a problem in many adolescent and adults. This work is intended to learn what type of acne medications works the best. Acne medications were used on a culture of Propionbacterium acne to determine which one had the most effect. It was determined that the antibiotic had more of an effect on the acne. In conclusion it is proven that antibiotic medications had more effect than the over the counter medications. Future work is planned to determine if the antibiotic medications are still most effective against any of the other acne medications.

Project Number: MBI041

Grade: 8

Title: Taste

Abstract: What is the lowest concentration of a salt solution that still has perceptible taste for humans? Ten participants were given ten different concentrations of salt solution to taste. The concentrations tested were 10, 1, .1, .01, .001, .0001, .00001, .000001, .0000001, and .00000001. Data collected included the facial expressions of the subjects and whether or not the salt was tasted. The quantitative data was tallied to determine which concentrations the people could taste. The data showed that the lowest concentration at which the salt was still tasted by most of the participants was the .00000001 percent solution.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI042

Grade: 8

Title: Effect of Vitamins on Seeds

Abstract: The purpose of this experiment is to discover if vitamins have an effect on seed germination and growth. Vitamins A, C, D, and E were dissolved in bottled water. Ten planting pots were used with one sunflower seed planted in each pot. Two pots were the control plants which did not receive vitamins. For three weeks the plants were watered every day at 3:30 pm and growth rate was charted. Vitamin D and A plants had highest growth rate and fastest germination time, followed by vitamins C and E. The control plants had slowest growth rate and were last to germinate, proving th! at vitamins are beneficial to plant growth.

Project Number: MBI043

Grade: 8

Title: The Effect of Wood Ash on P.nanus

Abstract: The purpose of this experiment is to see if bean plants (*Phaseolus nanus*) will grow healthier in regular soil, a store bought fertilizer, or hardwood ash. The hypothesis states that if bean plant growth is related to type of fertilizer, then the plants will grow healthier and taller in a store bought fertilizer, as compared to a hard wood ash or soil without fertilizer. The data collected proved that hardwood ash plants grew the healthiest, followed by unfertilized soil plants, and the shortest were the store bought fertilized plants.

Project Number: MBI044

Grade: 7

Title: The Effect of Lighting On Plants

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI045

Grade: 7

Title: Why the Grass Doesn't Grow

Abstract: Everyone wants a nice lawn. The purpose of my project was to determine why the grass is not growing in part of my yard. I gathered soil samples from an area where the grass doesn't grow and from areas where the grass grows well. I tested each sample's pH level and the levels of three important nutrients. My tests showed that the pH was too high and the soil did not have the proper level of nutrients in areas where the grass does not grow. I concluded that the level of pH and nutrients is important for grass to grow.

Project Number: MBI046

Grade: 7

Title: Do Power Bars change the pH of saliva?

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI047

Grade: 8

Title: Radishes Magnetized

Abstract: Farming is an important element in our society today. Farmers have to find new ways to grow crops faster and better to keep up with our constant growing civilization. If my experiment works it will help people all over the country. My experiment is to try growing a plant with magnets put in the soil while it grows. For my experiment I got two potted radish plants watering both the same and keeping them in the same place to get rid of unwanted variables, then I put magnets in one of the pots and recorded their growth for 2 weeks.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI048

Grade: 7

Title: Study of Tropisms

Abstract: How do light, water, and minerals affect a plant's tropism? If given light, water, and minerals plants will grow in the direction of those variables. Phototropism: A plant was placed in a closed box, with light at one end. It grew in that direction. Geotropism: Seeds were placed between pieces of glass. Once they germinated, the glass was turned. The seeds followed gravity. Hydrotropism: Seeds were placed in a planter with a screen. Once they germinated, roots would come through the screen and turn back toward water. Hydrotropism was unsuccessful. Light and gravity proved to be the strongest tropisms.

Project Number: MBI049

Grade: 7

Title: Amount of Oxygen and Aquatic Plants

Abstract: This investigation was to determine which aquatic plant generates the most oxygen. Three samples of four plants were inserted into test tubes with water added to fill each to the top, and then inverted into plastic containers filled with 300 ml of water. They were covered with plastic wrap and secured with rubber bands. After photosynthesis took place for 2 weeks producing oxygen, the water total in the containers should have increased. Instead, data showed it decreased. This may be because of evaporation for the plants absorbing the water.

Project Number: MBI050

Grade: 8

Title: How Temperature Affects Mold Growth

Abstract: This experiment was designed to determine how temperature affects mold growth on bread. Twelve pieces of white bread were cut into 5x5 cm squares. I separated them into 12 Petri dishes. Twenty mL of water was measured into each Petri dish to control the amount of moisture. Three Petri dishes were then placed in three closed boxes to control the amount of light. One box was placed in the refrigerator, one at room temperature, and one near the heater which was set to 34 C. After 4 weeks the mold in the dishes by the heater grew fastest.

Project Number: MBI051

Grade: 7

Title: Colored Light and Plant Growth

Abstract: My project is titled Colored Light and Plant Growth. This experiment was designed to see what the best growing conditions to grow marigold plants. The colors of the glass I used were red, green, yellow, and a control, which was no light. I determined what colored glass grew the most plants and which colored glass grew the tallest plants. This experiment can help botanists, gardeners, and anyone who likes plants.

Project Number: MBI052

Grade: 7

Title: Soil PH and Plant Growth

Abstract: To see if soil pH affects plant growth and which pH is the best. pH 7 is best for plant growth as it was the 1st to grow flowers and peas, had the highest percent of mature peas and had the tallest plant size at week 6. pH 8 was 2nd best followed by pH 9 then pH 6. pH 5 had no growth.

Project Number: MBI053

Grade: 8

Title: A Growth in Compost

Abstract: chose to do this experiment because I wanted to find an effective compost to help my family's plants and flowers grow more efficiently. I prepared my planting area. I made my compost mixtures. Then, I planted the plants. Lastly, I watered the plants each day and recorded results each week. The height and number of stems for each plant steadily increased during my experiment. These results gave me a clear view of which compost worked the best. I found out that the peat moss compost worked the best, which denied my hypothesis of the grass compost working the best.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI054

Grade: 8

Title: Is Brighter Better?

Abstract: The purpose of my project was to see if the grass would grow faster under a red or white light. First, get four Styrofoam cups and fill them with ½ cup of potting soil, place ten grass seeds in each cup (about ½ inches deep into the soil), put 4 tsp. of water in each cup (don't water everyday), and place two cups under both the red light and the white light. My data shows the red light grew slower than the white light. They evened out in the end. My conclusion states that my hypothesis was incorrect.

Project Number: MBI055

Grade: 7

Title: Compatible Ecosystem

Abstract: "Compatible Ecosystems" tests the exchange of oxygen and carbon-dioxide. The Investigator worked this experiment by using a plant and consumer animal (goldfish and elodea plant). In one jar was placed a goldfish. In the second, a plant. In the third, the Investigator placed both a goldfish and elodea plant. By adding Bromothymol Blue, the Investigator discovered that the ecosystem with only an animal did not have enough oxygen, and the ecosystem with only a plant did not have enough carbon-dioxide. The ecosystem with both organisms had an even exchange, proving the importance of all living organisms.

Project Number: MBI056

Grade: 7

Title: 5 Second Rule- Myth or Reality

Abstract: This project was to find if you could drop food on the floor, leave it there for 5 seconds, pick it up and eat it because it had less bacteria on it. A baby carrot was dropped on the floor and left for 2, 5, 10, 30, and 60 seconds. I then swabbed the carrots and placed the swab in the Petri dish. I placed the dishes in a cool dark closet. After a one-week period there was a lot of bacteria on each carrot. The time it laid on the floor did not seem to matter.

Project Number: MBI057

Grade: 8

Title: The Effect of Weed Killers on Moss

Abstract: This is an experiment to tell what weed killer has the most effect on common moss. I kept five containers of moss and miracle grow potting soil and watered them every other day. I used "ROUNDUP", "PREEN, and "WEED BE GONE" on the plants as instructed and waited for them to work. I took measurements of their diameter, color, and health. I will use this information to determine which product had the quickest and greatest effect on the moss.

Project Number: MBI058

Grade: 7

Title: Oxygen Levels and Goldfish

Abstract: The purpose of this investigation is to determine if the breathing rate of goldfish will be affected by a decrease in the oxygen level in their water. A goldfish was placed in an aquarium with an air pump. Its breathing rate was measured for thirty seconds after two, four, and six hours. Then, the goldfish was placed in a fish bowl without an air pump. Its breathing rate was measured for thirty after two, four, and six hours. This was repeated for ten goldfish. In the fish bowl without an air pump the goldfishes' breathing rate was faster.

Project Number: MBI059

Grade: 8

Title: Mighty Mice

Abstract: The purpose of this project was to conclude if creatine monohydrate is the most effective way to increase the rate at which mice gain weight. I feel the results of my experiment would benefit anyone interested in safely and effectively increasing their overall body mass.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI060

Grade: 7

Title: How Does pH Affect Plant Growth

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI061

Grade: 7

Title: Spontaneous Generation

Abstract: I'm doing a project to re-disprove spontaneous generation, because it was disproved such a long time ago. In this experiment I will be using boiled soup broth in two different test tubes. One test tube with an S-Shaped tubing coming out of the top, and one test tube with a straight tube coming out of it. I will observe the tubes for eight days. Each day I will record what the broth in the test tubes looks like. Then I will see if spontaneous generation is true or not.

Project Number: MBI062

Grade: 8

Title: Yeasty Beasties

Abstract: The purpose of this experiment was to see which type of sugar reacts with cooking yeast the most. White sugar, brown sugar, and other sugar products were mixed with yeast and the carbon dioxide produced was collected and measured for volume. Brown sugar reacted the most with the yeast and produced the most carbon dioxide. This experiment would be beneficial for food preparers and food chemists.

Project Number: MBI063

Grade: 8

Title: Anticancer Effects of Curcumin

Abstract: Curcumin, the primary component of the Indian spice turmeric, has been shown to effectively block the growth of many types of cancers, including colon and prostate. We decided to see the effects of this omni-potent spice on pancreatic cancer, the fourth leading cause of cancer-related death in the U.S. It has extremely poor prognosis and treatments for this disease take too much time and money. While experimenting by SRB assay, I found that curcumin decreases the survival rate of the cells. My conclusion is that curcumin can be used as an anticancer agent for the treatment of pancreatic cancer cells.

Project Number: MBI064

Grade: 7

Title: Cigarette Smoke and Plants

Abstract: Second hand smoke has been found to have a detrimental affect on humans and I wondered if it would also have a negative affect on plants. Twenty-four plants were tested, half were exposed to second hand smoke, and half were not. The plants that were exposed to smoke, sat in a smoke chamber, while the plants that were not, sat in a chamber without smoke. Plants that were exposed to smoke died earlier and faster than the plants that were not exposed to smoke.

Project Number: MBI065

Grade: 7

Title: Water Temperature and Plant Height

Abstract: The purpose of this investigation was to determine if water temperature affects plant height. I watered grass seeds with cold, hot, and room temperature water. I allowed the grass to grow for five weeks. At the end of the five weeks I measured and recorded the final plant heights. The average height for the plants watered with cold water was 11.6 cm, hot water was 11.9 cm, and room temperature water was 12 cm. The hypothesis, those plants watered with room temperature water will grow tallest was not supported. There was only an insignificant height difference of .4 cm.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI066

Grade: 7

Title: Will Worms Enrich Soil?

Abstract: Have you ever dug in the dirt after a heavy rain to find numerous worms burrowing in wet soil? The purpose of this investigation was to find out if worms enrich soil. The experimenter hypothesized that worms would increase nutrient levels in soil. Four containers of soil containing 24 earthworms in each and four with 24 redworms in each were tested weekly for 4 weeks with a NPK soil test kit. The worms were fed a vegetable puree and crunched leaves, each box receiving the same amount every week. The results displayed a steady increase in the nutrient levels over the course of the testing period. This investigation showed that worms do enrich soil.

Project Number: MBI067

Grade: 7

Title: Why Do Our Ears Pop?

Abstract: I want to find out why our ears pop. I talked to a group of people and explained why our ears pop. Also, I showed them using an experiment. The pop that is heard is the equalization of air pressure when the air moves from one area of concentration to another. The reason you feel a pop in your ears is because of the change in air pressure.

Project Number: MBI068

Grade: 8

Title: Is His Mouth Cleaner Than Mine?

Abstract: The reason I did this project was to find out if dogs have cleaner mouths than humans by measuring plaque. I measured plaque levels by using a dye that sticks on plaque. I applied this dye to the dogs' mouths with a toothbrush. In every test the dogs had less plaque than the humans. The contrast between the dogs and humans was significant. In conclusion the dogs had significantly less plaque than the humans. If I were to do this project again I would use a flavorless dye that the dogs wouldn't try to lick off.

Project Number: MBI069

Grade: 7

Title: Moldy Bread

Abstract: Many people want to know how mold could be prevented. For my experiment I have chosen to find a way. I started by finding acidic liquids. I believe that the more acidic the liquid is the better it would prevent mold growth. The experimenter will spray non-preserved bread with acidic liquids and place them in a basement. Then I would record the mold and find out which acidic liquid would prevent the most mold.

Project Number: MBI070

Grade: 8

Title: How will time on the computer affect a middle school student's vision?

Abstract: In my project I'm testing students on their vision after using computer. They will take a vision test, play a game on the computer, and retake the vision test. The student will be tested for three intervals of 5, 10, and 15 minutes. The materials needed are: eye chart, computer, subjects, journal, ruler, tape, and poster board. My hypothesis was that the more time a student spends on the computer, the more their vision will worsen. My hypothesis was proven correct because most students scored better on the eye test before the computer rather than after the computer.

Project Number: MBI071

Grade: 7

Title: Butterflies

Abstract: 14 caterpillars arrived, by mail, in two containers with food. When the caterpillars started to pupate, I labeled each one with a number. I then separated the chrysalises into two butterfly sanctuaries. One sanctuary was placed in our garage and the other in my bedroom. I sprayed the chrysalises every evening to keep them moist. I recorded the day that each butterfly emerged. As soon as the butterflies emerged, I fed them a mixture of honey and water. Once all the butterflies emerged, I calculated the average pupation time for each group of chrysalises. The results supported my hypothesis.

INTERMEDIATE DIVISION – BIOLOGY

Project Number: MBI072

Grade: 7

Title: Are Those Eyes 'Fur' Real?

Abstract: The purpose of this experiment was to see if the dog's fur color effects their red eye reflex in flash photography. To start my project, I first measured distances away from the camera, 180 cm to 360 cm. I had to estimate between distances due to the uncooperativeness of the dogs. Then, with help from my assistants, we kept the dogs still to take 3 to pictures of each. I then photographed each dog. My experiment proved that fur color does effect the red eye reflex in flash photography.

Project Number: MBI073

Grade: 8

Title: Do Earthworms Improve Plant Growth?

Abstract: The purpose of this experiment was to determine if earthworms improve plant growth. Plants were grown in six containers, half of which contained earthworms. All containers were exposed to the same conditions. A daily log of plant height was kept. The plants grown in the containers with earthworms grew an average of 21% taller than those without earthworms. The average growth rate for the plants grown in the containers with earthworms was 0.48cm/day compared to 0.40cm/day for those grown in containers without earthworms. The experiment proved that earthworms improve plant growth by aerating the soil and improving water absorption.

Project Number: MBI074

Grade: 7

Title: How does pollution effect animals and plants?

Abstract: Please visit exhibit for student's abstract.

Project Number: MBI075

Grade: 8

Title: How Dirty Is Your School?

Abstract: My first step in this experiment was to background research on past trials of collecting bacteria from surfaces in schools. With this, I made my hypothesis that the pencil sharpener would be the dirtiest area in the school. My next step was to make auger for the bacteria to grow on out of unflavored gelatin, water, and bouillon cubes (beef). I then collected bacteria from each area with a cotton swab three times per area, and streaked it onto the hardener auger. The bacteria grew under a heat-light for ten days. Using a colony counter, I measured the bacteria in each petri dish.

Project Number: MBI076

Grade: 8

Title: Seed Germination

Abstract: How does freezing seeds affect germination? To determine the answer of this question, five different types of seeds were exposed to approximately -79 C. Grouped seeds were frozen for one, two, three, or four days in dry ice. After the seeds were removed from the dry ice, the seeds were placed in Petri dishes with a wet paper towel. The germination rate of the seeds was recorded for seven days. Overall, seeds that were frozen germinated quicker than the seeds that were not frozen. This may have occurred because the seeds that were exposed to the dry ice had been scarified.

INTERMEDIATE DIVISION – CHEMISTRY

Project Number: MCH001

Grade: 7

Title: Comparing Stain Removers

Abstract: Many people in my house accidentally stain their clothing. My project's purpose was to see which stain remover is the most effective. I stained six different types of cloth with six different stains and tested six different stain removers on each stain. I determined that the Shout Gel was the most effective. I think it worked the best because of its built-in scrub brush, but would like to further research for other reasons.

Project Number: MCH002

Grade: 7

Title: Rub a Dub Dub, No Flames After Suds!

Abstract: The purpose of my research project was to determine if repeated laundering will alter the flame resistance of children's sleepwear. My hypothesis states that repeated laundering will decrease the flame resistance of children's sleepwear. I chose to mimic the vertical flame test method that is used by the United States Consumer Product Safety Commission to test flame resistant fabrics used in the production of children's sleepwear. The data obtained in my research does not support my hypothesis but shows that repeated laundering actually increased the flame resistant properties and decreased the flammability of the sleepwear fabrics that I tested.

Project Number: MCH003

Grade: 7

Title: "What's in YOUR Water?"

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH004

Grade: 8

Title: Making A Calorimeter

Abstract: The purpose of this experiment was to create a homemade calorimeter to test which foods contained the most calories. A homemade calorimeter was constructed using tin foil, a coffee can, and a screen among other materials. The different foods were then burned to see which one raised the temperature of a test tube of water the most, which would mean a higher calorie content. This experiment could benefit dieters and nutritionists, as they would need to know what types of foods have the most calories.

Project Number: MCH005

Grade: 8

Title: Sulfur to Safer

Abstract: The purpose of this experiment was to test whether onions could reduce the amount of sulfur in diesel fuel, as sulfur is a major pollutant which comes from the burning of diesel fuel. Green onions were placed in two different types of diesel fuel with different sulfur concentrations. After letting the onions sit in the fuel for several days, the diesel fuel was retested for sulfur concentration. This project could benefit environmentalists as it might lower the effects of pollution caused by diesel fuel.

Project Number: MCH007

Grade: 8

Title: The Process of Electroplating

Abstract: Electroplating is known as making an electrically conductive object with metal as a layer using electric current. My project was to find out what happens when silver and copper coins are put through the electrolysis process. My process includes putting the coins in water (electrolyte) for 15 minutes, and adding salt and vinegar into the water. It was determined that the electric current carried the particles from the copper coin to the silver coin. Testing other metals for electroplating could extend this study.

INTERMEDIATE DIVISION – CHEMISTRY

Project Number: MCH008

Grade: 7

Title: H₂O! No! Is Your Water Fit To Drink?

Abstract: The problem: "Which one of ten water sources has the least of three specific contaminants?" It is hypothesized that the water sample purified through activated carbon and reverse osmosis will have the least contaminants when compared to municipal or bottled water samples. A brief procedure of the experiment is as follows. Each of ten water samples was collected and tested for chlorine, hardness, and TDS (total dissolved solids). The ten samples were from: six municipal water sources, three bottled water brands, and water purified through carbon and reverse osmosis. Data was taken and recorded. The results do support the hypothesis

Project Number: MCH009

Grade: 7

Title: Amount of Vitamin C in OJ Brands

Abstract: If different priced brands of orange juice are tested for the amount of vitamin C they contain I believe the more expensive brand will contain the most vitamin C. I began with 4 brands of juice and poured a five 5mL samples for each brand. Iodine was then added a drop at a time until the juice turned blue. This procedure was followed 5 times for each brand of juice. The price of the juice did not seem to affect the amount of vitamin C. Fresh juice tested with more iodine than frozen.

Project Number: MCH010

Grade: 8

Title: How Quick Does your Pain Reliever Work?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH011

Grade: 7

Title: Rust

Abstract: The problem is what liquid makes iron rust the most. It is hypothesized that salt would make the iron rust most. A brief procedure of my experiment is as follows. I started my experiment on 12/22/06 and I poured my 6 liquids into 6 different containers and after about 5 weeks of waiting I observed my nails and wrote down the state of each nail such as the color of the liquid, the amount of rust on the nail, etc. The results did not support the hypothesis. Vinegar made the nail rust the most.

Project Number: MCH012

Grade: 8

Title: The Miners Said, "Let There Be Light!"

Abstract: Based on written correspondence with five Quecreek miners concerning the use of glow sticks in the mining industry, this investigation was conducted to study the effect of temperature on chemiluminescence as determined by the duration of glow time, intensity of light emitted, and spectral analysis of six colors of glow sticks. The investigator constructed a compartmentalized styrofoam insulation box to maintain water bath temperatures of 10, 20, and 30 degrees Celsius for the glow sticks. Every thirty minutes, each glow stick was transferred to a dark view box with black drapery, also constructed by the investigator to serve as a controlled environment, to take digital light meter readings of the intensity of light emitted and to examine the spectra with a spectroscope. It was concluded that for all six colors of glow sticks, an increase in temperature results in increased intensity but decreased duration of glow time. A decrease in temperature results in decreased intensity, but increased duration of glow time. The colors observed in the spectroscope were found to be a function of the intensity of light emitted by the glow sticks.

Project Number: MCH013

Grade: 8

Title: Organic vs. Non-organic: Let's "C" the Difference

Abstract: The purpose was to find if chemicals affect the vitamin C content of fresh squeezed non-organic fruits and vegetables. I hoped to prove that pesticides and fertilizers have a negative effect on the vitamin C content. First, make a vitamin C indicator. Next, add the juice to the indicator by drops. When the indicator becomes clear, record the number of drops. Vitamin C tablet averaged 2.7 drops, orange 4.3, carrot 16.3,

INTERMEDIATE DIVISION – CHEMISTRY

organic carrot 18.3, pepper 2.7 organic peppers 2.3. I discovered chemicals had no effect overall on the vitamin C content.

Project Number: MCH014

Grade: 8

Title: The Meltdown

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH015

Grade: 7

Title: The Effectiveness of Stain Removers

Abstract: What stain remover effectively removes the stain?

Project Number: MCH016

Grade: 7

Title: Which Nut Has the Fewest Calories?

Abstract: Which nut has the fewest calories? It was hypothesized that the cashew would contain the fewest calories per gram. Nine different kinds of nuts were used in this investigation: almonds, Brazil nuts, cashews, hazelnuts, Macadamia nuts, pine nuts, pecans, pistachios, and walnuts. All of these nuts were burned in a controlled experimental procedure, and then chemical formulae were applied to the data to compute calories per gram. The results obtained from this experiment showed that the pecan had the fewest calories per gram, followed closely by the cashew, so the hypothesis was incorrect. The Macadamia nut had the most calories per gram, followed closely by the Brazil nut. Further research revealed that nuts that contained more oil and cost more money had more calories per gram.

Project Number: MCH017

Grade: 8

Title: The Meltdown

Abstract: This project will investigate the burning time of different colored candles. Nine candles of the same brand and size were purchased in five different colors. The investigator burned each candle in each color group and carefully recorded the time it took each sample to completely burn down. A white sample served as the control. If this project were done again in the future, scented vs. unscented candles would be tested for the longest burning time.

Project Number: MCH018

Grade: 8

Title: The Effect of Var. Amounts of Acetone and DVA Solution on the Mass of PVA Fibers

Abstract: By doing this experiment, I hope to prove a difference in the masses of the fibers when varied amounts of PVA solution and acetone are used. In doing this project, I added different amounts of acetone and PVA solution, and then pulled the fibers out and let them dry for 20 minutes. I weighed them on an equal arm balance. There wasn't really a pattern in my results. The 40 ml PVA solution and 60 ml PVA solution produced the fibers with the most masses. The 90 ml PVA solution and 10 ml acetone produced the fibers with the least masses.

Project Number: MCH019

Grade: 8

Title: Testing Water for Pollutants

Abstract: This experiment was conducted to identify certain water pollutants found in local water sources. Eleven water sources were collected and underwent seven pollutant experiments. The seven experiments were conducted with scientific instruments and materials provided by MAWC – McKeesport Water Plant. The results determined that distilled water had the least amount of pollutants. I discovered that all of the water sources contained pollutants, but I was surprised with the results which were not conclusive with my original hypothesis.

INTERMEDIATE DIVISION – CHEMISTRY

Project Number: MCH020

Grade: 8

Title: What is the effect of Phosphoric Acid in soft drinks on tooth decay.

Abstract: I wanted to see if the phosphoric acid in Pepsi and Coke would decay the enamel of a human tooth. I wanted to test this because many people drink soft drinks and they do not know what it does to their teeth. I soaked the teeth in containers of Pepsi and Coke. Over timed soak periods I took visual observations. I weighed the teeth before and after being soaked. My experiment showed tht the teeth did not lose weight after being soaked. I proved my hypothesis wrong because I expected the teeth to lose weight but they did not. Future improvements for this experiment are soaking for longer times, use more acidic drinks or different liquids.

Project Number: MCH021

Grade: 8

Title: To Grow or Not to Grow?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH022

Grade: 7

Title: Are Calorie Charts on Food Labels Accurate?

Abstract: The purpose of my science project was to see if calorie counts on food labels are accurate. My hypothesis was that if I burned various foods in a homemade calorimeter and calculated the calories, the results would be the same as the company's results because I am basically using the same test that they use. I burned the various foods and calculated the calorie counts. My hypothesis was mostly correct, because the Big Mac and Twinkies were nearly the same, but the Cheerios had 88% more calories than stated. The application is not to trust everything you read.

Project Number: MCH023

Grade: 7

Title: Wet Wood Challenge

Abstract: Architects often design and build decks outdoors. For my project, I will determine which type of wood would hold the most water. In my project, I'm going to use Oak, Redwood, and Cedar. I will determine their masses before and after soaking in water. Hopefully, I will determine which wood to use when building an outside renovation. A high absorption of water would not be desirable. A low absorption rate would be a good choice for outdoor home improvement projects.

Project Number: MCH024

Grade: 7

Title: Acid Rain's Affect On Roof Materials

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH025

Grade: 8

Title: To Melt Or Not To Melt

Abstract: My question was which substance is the most efficient for melting ice? I hypothesized that it would be the mineral rock salt because that is what is commonly used. My purpose for doing this project was with winter coming and living on a large hill I wanted to see what the best thing to use was. I poured 236.6ml of water into four baking pans, labeled them Group A, and placed them in a large freezer. Then I poured 118.3ml of each of the four substances, rubbing alcohol, mineral rock salt, sodium chloride, and cat box litter, into the four remaining baking pans and then added 236.6ml of water to that and placed them in the freezer. I labeled this Group B. When all the baking pans had completely solidified, at least the ones that would, I took them out of the freezer, pored 118.3ml of the substances on top of Group A and observed them as they melted. In Group a, the rubbing alcohol melted the ice the fastest. The mineral rock salt, the sodium chloride and the rubbing alcohol all prevented the ice from forming in Group B.

INTERMEDIATE DIVISION – CHEMISTRY

Project Number: MCH026

Grade: 7

Title: Is Our Local Water Acidic?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH027

Grade: 8

Title: Metals Vs. Acids

Abstract: I selected this topic because I wanted to know how metals would react with acids. By doing this experiment I hoped to prove that the metals would not react in the same way. I let the metals sit for 24 hours and observed them at intervals throughout the time period. I weighed the metals before and after each experiment to get a better perspective of how large or small each reaction is. During the experiment I found that copper reacted the least to both acids and that the alloy steel reacted either the most or second most.

Project Number: MCH028

Grade: 8

Title: What affects amylase activity

Abstract: How does temperature and concentration affect the amylase enzyme activity. Take a starch plate and punch 4 holes in the starch. Inject each hole with the concentration amount of the enzyme. Repeat steps 1-3 and place in either 4, 25, 37 or 50 degree C incubator. After 24 hours, flood the plates with iodine. Measure the holes. Record data, Repeat steps 1-8 five times. The highest enzyme concentration worked the best. The fungus enzyme did a better job than the pig enzyme did. The temperatures 37 and 50 degree C did similar jobs and had similar results with both enzymes.

Project Number: MCH029

Grade: 7

Title: Making Tasty Soymilk in Your Own Kitchen

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH030

Grade: 8

Title: Which Cover Protects Ag from S?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH031

Grade: 7

Title: The Diet Coke Fountain

Abstract: This experiment was to check if the size of the spout or number of mentos in a diet Coke bottle affected the height of the foam (fountain). Mentos were dropped into a 2 liter bottle of cola and the foaming cola was measured. As more mentos were added and/or the spout got smaller, the foaming cola fountain got higher. The physical and chemical reactions increased with the change in number of mentos and spout size.

Project Number: MCH032

Grade: 7

Title: Chromatography ..an experiment to DYE for

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH033

Grade: 7

Title: Condensation Explanation

Abstract: My science fair project is about condensation. Specifically, it is about the many things that affect the rate of condensation on a cold beverage container. My hypothesis was formed from observations of how much a cold drink sweats, or condenses on a warm day. Further research has indicated that the

INTERMEDIATE DIVISION – CHEMISTRY

amount of condensation is related to more than just the temperature difference. From my testing, I concluded that my hypothesis is correct. The rate of condensation is affected by its temperature, the amount of moisture in the surrounding air, and the condition of the condensing surface.

Project Number: MCH034

Grade: 8

Title: How Temperature Affects Enzymes

Abstract: The purpose of this investigation was to see how temperature affects liver enzymes in peroxide. I started by making a liver preparation where I soaked filter paper disks. Each disk was placed on the end of a one-hole stopper. The stopper was replaced on test tube, which was filled with 60 ml of peroxide. I inverted the test tube in .9 L of water. I recorded the time it took each disk to rise. The average time it took for the disk to rise was: 0 degrees=2.82; 27 degrees=3.96; 37 degrees=10.57; 100 degrees=25.82; also 100 degrees=7.43. Lower temperatures reacted fastest with the enzymes.

Project Number: MCH035

Grade: 7

Title: Pretty in Pink

Abstract: The purpose of my experiment was to see whether brand name or generic vinegars have the most acidic acid. I used sodium hydroxide, phenolphthalein, and a titration tube to find my answer. My data shows that, out of all six vinegars, there wasn't much difference among their acetic acid percentages. Both generic and brand name vinegars tested the same as their label ratings, around 5% acidic.

Project Number: MCH036

Grade: 8

Title: It's Elementary, My Dear

Abstract: Does the type of ink determine the distance traveled on chromatography paper? Ten different pens were tested using the paper chromatography process. Samples were placed on chromatography paper and developed with water or alcohol. The Rf values were calculated to determine the distance the ink traveled. According to the data, the Rf value of the Bic pen was the shortest. Rf values increased in order for the following pens: Bic, Paper Mate, Rose Art, Pentel, Bic- Atlantis, Parker, Promary, Bic-Cristal, Unision, and Z-Grip. The Rf value of the Z-Grip was the greatest.

Project Number: MCH037

Grade: 7

Title: Understanding Diet Coke and Mentos

Abstract: Everybody says that Diet Coke has the biggest reaction with Mentos. This experiment was to find out more about this reaction and if this was true and why. Many different types of soda were bought and tested. I bought many of each brand and dumped in 12 pieces of Mentos. Then, I recorded how far each soda shot out. My experiment shows that under similar conditions, Diet Pepsi has the biggest reaction. It also proved that Diet soda has a bigger reaction than regular. This is probably because diet is lighter and may have more carbonated water content in it.

Project Number: MCH038

Grade: 8

Title: Best Biodiesel

Abstract: Biodiesel is environmentally friendlier than diesel, but diesel has better cold weather performance. The engine clogs between the cloud and gel points. This experiment compared the cold weather performance of biodiesel to diesel by finding the cloud and gel points of each. Biodiesel was made from different vegetable oils and was tested for cold weather performance. The cloud point does not correlate to the gel point. Olive biodiesel is more reliable in cold weather because of the low cloud point. Having a lower cloud point shows the engine will not clog until it is colder than the cloud point.

INTERMEDIATE DIVISION – CHEMISTRY

Project Number: MCH039

Grade: 8

Title: Ice, Ice, Go away... Which is the Fastest way?

Abstract: Once ice is completely solidified, it becomes very hard to melt. This work is intended to determine the effect of different substances on melting ice the fastest. Fourteen pans of water were frozen. Seven had the substances poured on top after they were frozen. The other seven had the other half of the substance added before they were frozen. The results were recorded. It was determined that calcium chloride melted ice the fastest. Future work is planned to determine if colder temperatures would change the melting time.

Project Number: MCH040

Grade: 8

Title: Ice Ice Baby

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH041

Grade: 8

Title: Fertilizer Fever

Abstract: Do Organic, Inorganic or No Fertilizers Help Plants Grow Best? I chose to do this project because many plant growers use inorganic fertilizers on their plants and the products from the plants when consumed by human beings can affect the human body. These Inorganic fertilizers can cause cancer and other diseases. If growers use organic fertilizers, it is safer for humans and eco-friendly. This project will determine if plants treated with organic fertilizers will grow just as fast as those treated with inorganic fertilizers.

Project Number: MCH042

Grade: 8

Title: Metals vs Liquids

Abstract: The purpose of my experiment is to exploit the effects of different liquids on different metals. First, I collected the metals and liquids. I set up a table with twenty-five cups. I filled five up with each liquid, and put each of the metals in each one. I then observed them for 10 days. The aluminum, copper, steel, and brass were most reactive in the ammonia and chlorine bleach. The stainless steel was reactive in the chlorine bleach. They were not reactive in the hydrogen peroxide, alcohol, and orange juice. Future work would be to test the effects of more liquids.

Project Number: MCH043

Grade: 7

Title: The Absorbtion of Rice Paper and Gauze in Water

Abstract: The purpose of this experiment is to find out which material out of these four: Umbria Paper, Sugar Cane paper, Mulberry Paper, or Gauze, would absorb the most water. The hypothesis was 'If three different types of Rice Paper and Gauze are soaked in water, then Gauze will absorb the most water, because it is made with many layers for maximum absorbtion. Thew procedure was to cut squares of each material and make packets out of them, then soak those packets in water for ten seconds and mass them. The percent mass gained was calculated and the average was found for each type. The results were that Mulberry Paper absorbed the most, followed by Gauze, then at much lower amounts by Sugar Cane and Umbria. The hypothesis was incorrect. The application to real life was that if a bandage was being made to absorb the most liquid, Mulberry Paper should be used.

Project Number: MCH044

Grade: 8

Title: Factors Affecting Hair Strength

Abstract: The purpose of this experiment is to determine whether hair color, treated or natural, affects hair strength. Four hair categories were tested: Light, dark, red, and chemically treated. The procedures are as follows: 3 hairs were collected from 5 people in each category. One hair was taped to a ring stand, forming a loop. A paper clip was hooked onto hair. Metal washers and weights were hung onto the paper clip until hair

INTERMEDIATE DIVISION – CHEMISTRY

broke. Weights and washers were weighted. Process was repeated. Regardless of treatment, red hair proved the strongest.

Project Number: MCH045

Grade: 8

Title: Catalyzing Carbonic Acids

Abstract: Colas create large fountains when Mentos mints are added. The goal of my experiment was to work with different colas to see which created the best geysers using this process. To do this, I first placed 5 mints into 3 bottles of 4 different types of cola. A video camera then measured the geyser height against a paper measuring roll. The amount of liquid remaining in the bottle as also recorded. I found that Diet Pepsi formed the best geysers.

Project Number: MCH046

Grade: 7

Title: What stains teeth the most?

Abstract: During the investigator's project, she tested Diet Pepsi, coffee, and tea on teeth to see which would stain them the most. The teeth were in the liquids for forty-eight hours. The Pepsi and Diet Pepsi decayed the enamel on the teeth. The coffee and the tea did not decay the enamel because you can see the shiny enamel on them. The teeth in the Pepsi and Diet Pepsi were dark, discolored and stained. They were almost black. The teeth in the tea and coffee were stained minimally. They were stained in the grooves and a circle around the outside. This experiment better explains how these beverages affect your teeth.

Project Number: MCH047

Grade: 7

Title: The Effect of Compounds on Capillary Action

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH048

Grade: 8

Title: Pepper Power

Abstract: In my experiment I used red, green, and yellow peppers. I chose to do this experiment because I wanted to see which color bell pepper had the most vitamin C and was the healthiest for you. Procedures I did were a 500mg vitamin C tablet. Then mix the dichlorophenol (crushed) salt with 500mL of water. Transfer the dichlorophenol solution to test tubes adding the vitamin C solution drop by drop until it hangs to a light amber color. Then take 1 color pepper and blend it. Take more of the dichlorophenol solution and add it drop by drop to the pepper solution until it neutralizes, count each drop. In my experiment red peppers had the most vitamin C, green had the second least and yellow had the least. In conclusion red peppers had the most vitamin C.

Project Number: MCH049

Grade: 7

Title: "Chemiluminescence, Which Reaction is the Brightest, and Which Last the Longest?"

Abstract: Chemiluminescence is the creation of light emission as the result of a chemical reaction. Four different chemiluminescent reactions were tested to determine which reaction produced the brightest light emission, and which emission lasted the longest. Brightness was determined by a spectrophotometer using the C.I.E. Brightness measurement. Commercial cyalume light sticks were the brightest and the light emission lasted the longest. In order of decreasing brightness and duration of emission, the remaining results were peroxyoxalate, luminol, and lucigenin. Cyalume may have been the brightest because the reactants were taken from commercial light sticks, while other reactants were measured and mixed.

Project Number: MCH050

Grade: 7

Title: Crystal Growth

Abstract: This project is about crystal growth. It will take two or more weeks to complete. In this project, the experimenter is going to determine how the temperature of the solution affects the growth of crystals. The

INTERMEDIATE DIVISION – CHEMISTRY

experimenter will make careful observation and measurements. Care must be taken to make sure the crystals grow up the string and not all over the jar. That will make it easier to work with and measure.

Project Number: MCH051

Grade: 8

Title: pH and the Scoville Scale: How Acidic are your Peppers?

Abstract: My project tests the pH of peppers and compares it to the Scoville Scale. My purpose is to see if there is any direct correlation between heat and acidity of peppers. My hypothesis says there will be a relationship between the two. I had to calibrate a pH meter to 7.01 in water. Then I had to blend each pepper into a liquid sort of state. Then I separated each pepper substance into cups and dunked the pH meter into the substance. My data concluded that my hypothesis was proven incorrect.

Project Number: MCH052

Grade: 7

Title: Electrolytes and Resistance

Abstract: The purpose of this investigation was to determine which substance gives the least resistance to an electric current. Forty cups were filled with water. Fifteen ml of salt was added to ten cups, fifteen ml of sugar to ten cups, and fifteen ml of cornstarch to another ten cups. A multimeter tested their resistance to an electric current. The average resistance for each substance was 1,000,000 ohms for distilled water, 473 ohms for salt electrolyte, 48,400 ohms for sugar electrolyte, and 42,200 ohms for cornstarch electrolyte. The salt electrolyte gave the least because it dissolved and formed an ionic bond.

Project Number: MCH053

Grade: 8

Title: pH vs. Voltage: The Fruit Battery Showdown

Abstract: In this investigation the experimenter will create 7 different kinds of fruit batteries. Once the batteries have been created, the experimenter will then test the pH and voltage level of each piece of fruit. The experimenter will wire three pieces of each type of the 7 various fruits together. Once wired to an LED light bulb the brightness will be measured on a scale of 1 to 5 (1 being the lowest and 5 being the highest) after 1 minute, 5 minutes and every 10 minutes for 1 hour. This will then be repeated on the remaining 6 types of fruit. This project will prove which of the 7 various fruits can produce the most electrical current for the longest period over 60 minutes.

Project Number: MCH054

Grade: 8

Title: Sweet Electricity

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH055

Grade: 8

Title: Balloons

Abstract: My project is all about balloons. My test was to see what color balloon would lose its helium the fastest. I tested this experiment by filling six balloons, two of each color, red, blue and green with helium. I measured them each day by wrapping a string around each and recording my results. My results in the first test were red lost the most helium and in the second test green lost the most helium. In both tests the blue balloons lost an equal amount of helium. In my conclusion I stated that my hypothesis was incorrect.

Project Number: MCH056

Grade: 8

Title: Soda Fountain

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH057

Grade: 8

Title: Effect of Antacids on Stomach Acid

INTERMEDIATE DIVISION – CHEMISTRY

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH058

Grade: 8

Title: Cans and corrosion

Abstract: The purpose of this experiment was to measure the effectiveness of the lining used in metal cans that contain food products. It was found that cans with acidic foods cause quick can corrosion if their is no inner lining in the can. This lining was found to protect the food and the can from corrosion. Pineapples in particular caused quick corrosion of unlined cans.

Project Number: MCH059

Grade: 7

Title: Observing the Presence Of Glucose

Abstract: The purpose of this investigation was to determine how much glucose is in different types of food and drinks. During this investigation urine glucose test strips were used to tell the concentration of the different foods and drinks tested. Pancake syrup, chocolate syrup, and Italian dressing had very high concentrations of glucose. The hypothesis, if different types of foods and drinks are tested for glucose concentrations, then chocolate syrup, pancake syrup, and cola will have very high concentrations of glucose, was not supported by the data.

Project Number: MCH060

Grade: 7

Title: A Better Fuel Cell - Coke or Pepsi?

Abstract: Flying cars, trains that travel at the speed of light - does that sound like the future? Well what is the future? I don't know the answer to that, but I know that my project is the future. In my project I made a bio fuel cell where I used Coke and Pepsi as fuels. I first assembled the fuel cell then I pumped the soda into the anode side of the fuel cell and oxygen to the cathode side and measured the resulting voltage. Coke was more effective, the measured voltage was 0.015 Volts, Pepsi gave 0.010 Volts.

Project Number: MCH061

Grade: 8

Title: Caffeine's Effect on Plant Growth

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH062

Grade: 7

Title: Crystals And Light

Abstract: I am conducting my project to prove that light can affect the color of crystals. Two different types of crystals will be grown under four different colored lights: blue, black, red, and sunlight. I plan to record changes in the crystals' color and growth everyday. After ten days, I will analyze the results to see if the light did affect the final outcome of the crystals' color. I am still collecting data and the final results are pending.

Project Number: MCH063

Grade: 8

Title: Melt Down

Abstract: In this experiment, the researcher tested the problem statement, "Which Substance Melts Ice the Best?". In this experiment, different substances (rock salt, liquid calcium chloride, and calcium chloride flakes) were tested to see which of the three melted the most amount of ice. A pan of ice with no substance added served as the control. Twelve pans of ice in total were tested in 3 trials, four pans per trial. After a period of 3 hours, the amount of ice each substance melted in each trial was recorded. In conclusion, after adding the amount of ice melted in all three trials, the calcium chloride flakes proved to be the best agent for melting ice. It was followed by the liquid calcium chloride, then rock salt, and then ice itself (the control). This experiment proved to be very successful and beneficial to the researcher and others as well.

Project Number: MCH064

Grade: 8

INTERMEDIATE DIVISION – CHEMISTRY

Title: H₂O Hardness & Effect on Stains

Abstract: The purpose of this project was to see if hard or soft water removed stains better. The hypothesis was: If a stain is washed in soft water, the stain will be removed more than if hard water is used due to the added metals in hard water. This causes soap to be less effective. The stains: grape juice, ketchup and coffee were each washed in five water samples from surrounding areas. The water samples were tested and the stained samples washed in hard water were not removed as well as the stains washed in soft water proving the hypothesis correct.

Project Number: MCH065

Grade: 7

Title: Marshmallow Power

Abstract: Does food coloring affect how much energy marshmallows give off? In this experiment, I will prove it does. Furthermore, there is a difference in energy released depending on color as well. By burning marshmallows and measuring the energy released, I concluded that pink marshmallows released the most energy, while white (colorless) released the least, with green and yellow ones in the middle. These results probably have to do with the type of chemical chain in each color of food coloring. My results imply that eating colored marshmallows increases one's calorie intake more than eating white ones.

Project Number: MCH066

Grade: 8

Title: Soil vs. Water

Abstract: Please visit exhibit for student's abstract.

Project Number: MCH067

Grade: 8

Title: Dance of the Dye

Abstract: The purpose of my project is to determine if temperature affects the rate of diffusion of dye in the water. Using different water temperatures, I added 0.1 ml. of dye in at each different temperature sample and measured the time it took for the dye to diffuse completely. My results showed me that the warmer the water is, the faster the dye dissolves. I also conclude that my hypothesis is valid.

Project Number: MCH068

Grade: 7

Title: To Preserve or Not to Preserve

Abstract: This experiment was chosen to see if there was a healthier way to preserve our food. Different dilutions of honey, lemon juice, and Fruiton were used, and sprayed over apples, strawberries and zucchinis. None of the substances really worked in preserving the food. For some of the food tested, the control decayed and molded less than the food with preservatives. It is better to preserve food with real preservatives instead of trying to make homemade ones.

Project Number: MCH069

Grade: 8

Title: Thermal Insulation of Coffee Cups

Abstract: The project evaluated the thermal insulation of coffee cups that made of different of materials, which included Styrofoam, paper, ceramic and glass. The study showed that the cup material, cup structure and coffee cup lid have a significant effect on thermal insulation. The Styrofoam cups had better thermal insulation and lower cooling rate than the cups made of other materials.

INTERMEDIATE DIVISION – COMPUTER SCIENCE/MATH

Project Number: MCM001

Grade: 7

Title: A Circular Massacre

Abstract: The Circular Massacre is a version of the Josephus Problem. Ten thousand sailors are arranged around the edge of their ship. Starting with the first, every other sailor is pushed overboard until they are all gone. The purpose of my project was to determine the position of the last survivor. I started by arranging different numbers of blocks along the edge of circle, and pushing them out of the circle until there was only one remaining. Based upon the patterns that I found, I developed a formula for finding the last survivor for any number of sailors on the ship.

Project Number: MCM002

Grade: 8

Title: The Birthday Paradox

Abstract: What are the chances of two people having the same birthday? A survey was created that asked 100 people to record the month and day of their birthday, age, and gender, making up qualitative data. The birthdays were tallied to determine the probability percentage of similar birth dates in the quantitative data. The data showed there was a 38% chance of the two people in this sample group of having the same birthday.

Project Number: MCM003

Grade: 8

Title: Magnetism and Mobile Comp. Devices

Abstract: To determine if magnetism affects mobile computer storage devices. Magnetism does not affect mobile storage devices

Project Number: MCM004

Grade: 7

Title: An Addition Shortcut

Abstract: In school, when his teacher gave the problem of summing the integers from 1 to 100 to his students to keep them busy, Gauss immediately wrote down the correct answer 5050 on his slate. The purpose of my project was to figure out a geometric representation of how he did that. I began by representing the terms in an arithmetic series with number cubes, and trying to make a consistent rectangle out of those cubes. I found many ways of making the rectangles, but only one of my devised methods was able to be used on any arithmetic series.

Project Number: MCM005

Grade: 7

Title: Finding the Centroid of a Quadrilateral

Abstract: Geocaching is an adventure game where participants set up caches all over world and share clues about location of these caches. One cache was hidden at the center of my local cemetery, an irregular quadrilateral. The purpose of this project was to devise a method to find the center of a quadrilateral. I drew the quadrilaterals on oaktag, hung them from their vertices, drew the plumb lines, and found the intersection point. I divided the quadrilaterals into triangles along both sets of diagonals, found the centroid of each resulting triangle, and found the intersection of the lines connecting the centroids.

Project Number: MCM006

Grade: 7

Title: String Art

Abstract: There are ninety-nine nails arranged around a circular board. Each nail is connected to every other nail. One more nail is added. The purpose of my project was to figure out how many strings are now on the board and how many new regions have been added. I started by drawing all the connections and counting the regions. Then I searched for patterns and used a spreadsheet to find the answers. These patterns could be useful in determining the best route for connecting network cables, or the least expensive routing for roads in a new housing development.

INTERMEDIATE DIVISION – COMPUTER SCIENCE/MATH

Project Number: MCM007

Grade: 8

Title: Mindstorms RIS vs. NXT

Abstract: My experiment was to test if the new LEGO Mindstorms NXT could do better than its predecessor, RIS (Robotics Invention System). I could make the NXT robot do better than the RIS robot by using the new ultrasonic sensor along the wheels to let the robot go straight along the wall. The RIS robot could not go through a turn that is in the middle of the wall, because of the touch sensor would not activate. My ultrasonic sensor allowed the robot to detect this kind of opening, thereby proving that the NXT can do better than RIS in a maze.

Project Number: MCM008

Grade: 8

Title: A Generic Formula for Regular Polygons

Abstract: There are formulas that can be used to find the area of many regular polygons. I didn't know one for finding the area of a regular octagon. The purpose of my project was to devise a formula using the side of the octagon to find its area. I drew many octagons, subdivided them into triangles, measured the side and the radius very accurately, and then calculated the area. In the process, I "found" a method that can be used to find the area of not only a regular octagon, but also of any regular polygon.

Project Number: MCM009

Grade: 8

Title: Golden Icosahedrons

Abstract: A regular icosahedron is a solid geometrical figure with 20 triangular faces. All of the triangles are equilateral. There are three mutually perpendicular rectangles within the icosahedron. The purpose of my project was to find out what kind of rectangles these are. I built 10 different icosahedrons from oaktag and measured the dimensions of the rectangles. Then I calculated those same dimensions using the edge length for reference, the Pythagorean Theorem, and common trigonometric ratios. Finally I calculated the ratio of length to width and discovered that the rectangles are golden rectangles.

Project Number: MCM010

Grade: 8

Title: Towers of Hanoi

Abstract: Tower of Hanoi puzzle was invented by French mathematician Edouard Lucas in 1883. Given a tower of eight disks initially stacked in increasing size on one of three pegs, transfer the entire tower to one of the other pegs, moving only one disk at a time, never a larger one onto a smaller. The purpose of my project was to devise a formula to calculate the minimum number of moves for any number of disks. I transferred varying numbers of disks endlessly until I figured out the most efficient way to make the transfer, then wrote an equation.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS001

Grade: 8

Title: The adhesiveness of various types of tape

Abstract: My purpose was to find out what kinds of tape stick what surfaces better. I hypothesized that the thicker tapes would stick to the surfaces better because there would be more adhesive to adhere to the surfaces. I used a bucket and water to measure the adhesive strength. In the end my hypothesis was wrong for the duct tape only the duct tape did the worst over all.

Project Number: MCS002

Grade: 7

Title: GUM

Abstract: Our science fair project was about trying to find which brand of gum lasted the longest. Our hypothesis was that the brand Stride gum would last the longest since they advertised it that it would last longer than any other gum. Our supplies were 10 pieces of Stride, Hubba Bubba, Bubblicious, Extra, Big Red, Juicy Fruit a stopwatch and a calculator. Our experiment consisted of chewing five different types of gum. These were Stride, Hubba Bubba, Bubblicious, Extra, Big Red, and Juicy Fruit. We divided who would chew each gum. Sarah chewed Hubba Bubba and Juicy Fruit. Evan chewed Big Red and Bubblicious. Kelsey chewed Stride and Extra. We chewed ten pieces of these gums until we thought that the flavor was gone. We then noted the time with the stopwatch and wrote these times on a piece of paper. After we had finished chewing all of the gum and collected the times, we took each of the gums' times and used the mathematical concept of mean to average out the time it would take to extract the gums' flavor. Our data showed that Stride lasted the longest among all of the gums and Bubblicious lasted the least among the gums. Our conclusion was that our hypothesis was correct that the brand Stride gum lasted the longest. It turned out that Stride lasted the longest and Bubblicious lasted the least.

Project Number: MCS003

Grade: 8

Title: Clean Up Your Act

Abstract: The purpose of this project was to see which carpet stain remover works best. Because we have white carpeting and there are dirt stains on it, I wanted to see if they could be removed. My hypothesis was that 409 Carpet Cleaner would work best. In order to find out, I bought two sample pieces of white carpeting and stained each section with coffee, marker, and chocolate. These being the most common types of stains. I then applied the stain removers according to the directions on their containers. Stain removers used were 409, Resolve Triple Action Spray, and Woolite Foam Carpet Cleaner. The Woolite Foam worked the best and proved my hypothesis wrong.

Project Number: MCS004

Grade: 7

Title: Sauce Be Gone

Abstract: The purpose of this experiment is to determine which product takes off baked-on sauce the best. Five products were tested: liquid Cascade, liquid Dawn, SOS pad, Downy liquid Fabric Softener, and Bounce fabric sheets. The procedures are as follows: 6 metal pans with sauce were placed into an oven for 1 hour. One was put into a dishwasher. The others received hot water and product. After 1 hour, pans were swiped 6 times then rinsed with a sink sprayer. Process repeated. Pans were weighed. Fabric softeners performed better overall than other products. As I hypothesized, Bounce performed the best.

Project Number: MCS005

Grade: 8

Title: Rain or Shine

Abstract: The reason I did this was to discover which local weather station is the most accurate. I tracked the low and high temperature predictions from three local television stations; KDKA, WTAE, WPXI. I then tracked the actual low and high temperature. The result was that WTAE weather forecast was the most accurate.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS006

Grade: 8

Title: Castaway

Abstract: This project is about fishing line strength within the same test weight. I used three different brands of fishing line, all with 3.629kg test weight. I chose, Berkley's Trilene, P-line, and Stren, because they are the most familiar brand names that I know. I thought that the actual test weight of the fishing line brands would be consistent with the given test weight. To do this experiment you need a very strong, elevated object, about two meters above the ground, there also has to be a round pole protruding horizontally from the top. I made this material out of a weight bench and metal pole. Start out with your base object, cut a three meter long piece of line from one of the fishing line reels. Then tie it to the pole protruding from the base object. Starting with one kilogram below the recommended test weight, tie the line onto the weights. Finally lower the weights slowly to the ground, until the line starts to become tense and the weight starts to lessen. Do this three times with each of the brands of the fishing line. During this procedure remember to change the line and record your data before every test.

Project Number: MCS007

Grade: 8

Title: Chip Off the Old Nail Polish

Abstract: Nail polish I paint you wear on your nails. I chose to do this project because I wanted to find out which brand would last the longest without chipping. The procedures for my project were to paint my nails with each brand and leave it on for 3 days and then record my data. I concluded that the most expensive brand lasted the longest without chipping.

Project Number: MCS008

Grade: 8

Title: Ads. vs. Consumer Behavior

Abstract: In the twenty-first century, millions of products, ideas, and services are available for purchase. In the era we live, however, the product itself is often given less publicity than the advertisement that describes the product. This work was intended to determine whether advertisements in the negative frame are more effective in gaining consumer approval than advertisements in the positive frame. Two different advertisements were created for this experiment, one advertising a 10% discount for the use of a credit card during purchase, and, the other, a 10% premium for cash. The results of this experiment were not statistically significant.

Project Number: MCS009

Grade: 8

Title: Is Wood Glue Cost Effective?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS010

Grade: 8

Title: Whiter Teeth From a Tube?

Abstract: Does one brand of toothpaste really whiten your teeth more than another? This work intended to see if one brand of toothpaste has a better whitening effect than another. Twelve eggs were soaked in three stains, four per stain. Four brands of toothpaste were then tested using one egg from each stain. The results and the difference of the shade before and after brushing the egg with toothpaste was recorded and analyzed. The results showed that one brand worked better than the others. It showed that Crest was a total of six shades lighter than Aim.

Project Number: MCS011

Grade: 7

Title: Show Me Your Pearly Whites!

Abstract: This project compared non-fluoride toothpastes, fluoride toothpastes, baking soda, and hydrogen peroxide and the affect of these cleaning agents on whitening stained teeth. These cleaning agents were selected since they are common products used for cleaning teeth by consumers. Twelve teeth from the same individual were obtained from an oral surgeon and were soaked in bleach to remove any possible

INTERMEDIATE DIVISION – CONSUMER SCIENCE

blood borne pathogens. Once soaked and rinsed, the teeth were placed in black coffee for one week. After staining the teeth, a baseline shade for each tooth was established by using a dentist's shade guide. The teeth were sorted into petri dishes and labeled. Each tooth was then brushed with their designated cleaning agent everyday for one week. After each daily brushing, the shade guide was used to determine the shade of each tooth. After completing three tests for each cleaning agent, the teeth were compared and it was noted that baking soda appeared to whiten coffee stained teeth most effectively. I learned a great deal about dental health not only through the research but also by conducting this experiment. It was an interesting project with unexpected results.

Project Number: MCS012

Grade: 8

Title: The Brightest Bulb in the Bunch?

Abstract: The purpose of my experiment is to discover which light bulb is best suited for home use. I believed a CFL bulb would be best suited. To test this, I measured light at four and eight feet in ways that simulated reading and safety uses. I also measured heat produced and current used by each bulb. Then, I analyzed the data and found that my hypothesis was not supported by it. The frosted white bulb had preferable results in all areas tested and is the bulb that is best suited for home use.

Project Number: MCS013

Grade: 7

Title: Do dimples on a ball make it go farther?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS014

Grade: 8

Title: Double Up

Abstract: My question is, if two different types of batteries are combined, will the strength be affected? I wanted to do this project because I have done projects like this in the past and I wanted to find more about the strength of batteries. My hypothesis was it will affect the strength. The materials I used were two of each type of battery, coated wire, battery holder, ball bearings(bbs), magnetic nail, wooden tray, plywood, and a switch. First, I connected the nail to the battery holder. Next, I turned on the switch. I put the nail in the bbs for 5 seconds. Then, I let the bbs fall into the tray. Then, I counted the bbs, and found the average. I did three trials with each type of battery. I made three combinations, Duracell and Energizer, Energizer and Panasonic, and Duracell and Panasonic. My hypothesis was correct. It seemed to have an affect. If I were to do this project again, I would change the types of batteries to different Dollar Store brand batteries. I have learned that if you combine two different batteries, you won't have the same strength.

Project Number: MCS015

Grade: 8

Title: What cell comp. sends texts fastest?

Abstract: Have you ever wondered how long it is going to take to deliver your text message? I hope to find out which cellular company delivers text messages the fastest. I will go to the stores of the cellular companies and send text messages on certain phones and record how long it takes for the other phone to receive the message. I will record the information from 4 different service providers and 4 different phones. The results of my study proved that the cellular device used does matter a little, but Cingular sends and delivers text messages the fastest.

Project Number: MCS016

Grade: 8

Title: Clean It!

Abstract: The project was to remove eyeliner stains from white cotton shirts. The hypothesis was if cleaners are tested on NYC eyeliner stains, then Clorox will remove the stain best because it's used to clean stains from white clothing. Shirt swatches were stained with eyeliner and then soaked in water and a cleaner, and results were noted. Dawn worked best, followed by Dial, Windex, and Clorox, which removed the stain the least. The hypothesis was incorrect. This information is very helpful and gives a clear solution to cleaning eyeliner stains.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS017

Grade: 8

Title: Pumpkin Size vs. Number of seeds

Abstract: My purpose for doing this project was to see if the large pumpkins had more seeds than the smaller pumpkins. Before I cut open the pumpkins and counted the seeds I realized that for my data I needed to measure the height and diameter of the pumpkins. After I tested my experiment my conclusion was it did not matter the size of the pumpkin because some smaller pumpkins had more seeds than the larger pumpkins.

Project Number: MCS018

Grade: 8

Title: Pop Quiz

Abstract: This experiment was about "popcorn". The investigator was curious about which brand of popcorn was the best value. Four brands were tested for amount of kernels popped and unpopped. A taste test was conducted in school with 40 students. Price was also recorded and graphed onto graph paper. The investigation found that Act II was the best value. If I were to do it again, I would choose the Stove Top popcorn for the next experiment.

Project Number: MCS019

Grade: 7

Title: Microwave, Fried, or Grilled Cookies

Abstract: The purpose of this experiment is to see which alternative cooking method works best if you don't have access to an oven. I will try to figure out if cookies turn out better microwaved, grilled, or fried, and this experiment will tell me the answer. I will make the cookies in those three ways, and record how they look every five minutes. I have concluded that the best alternative cooking method is using the grill when no other methods are available.

Project Number: MCS020

Grade: 8

Title: Patterning Shotgun Shells

Abstract: I love to go hunting, and was wondering if target load shotgun shells, which contain less gunpowder than all purpose loads, are more or less accurate than the all purpose loads. We shot 50 rounds, of two different manufacturers. I took the targets home and counted the number of pellet holes in each of the 30in. circles. After counting the number of holes in each circle, I calculated the average and standard deviation for each type of shell. My results indicated that the all purpose loads were the more accurate of the two different loads.

Project Number: MCS021

Grade: 7

Title: How Abrasive Is Your Toothpaste?

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS022

Grade: 7

Title: Stuck on You

Abstract: It's often a problem keeping bandages attached to your skin, especially when they get wet. Some appear to stick better than others. This experiment was performed to determine which brand of adhesive bandage sticks the best when wet. Four different sheer strips were applied to my hands, then placed into warm water. I swayed my hands in a consistent back-and-forth motion. Observations were made throughout the experiment to record the time and the degree of detachment. (mm) It was determined that Curad brand bandage stuck the longest when placed in water.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS023

Grade: 8

Title: Flowing Sauces

Abstract: Flowing Sauces is an experiment comparing four different barbecue sauces, Jack Daniels, Open Pit, Kraft, and Hunt. This experiment compares the viscosity or thickness of the sauces. I set it up like this, I bought a desk organizer and made a stopper. The stopper was placed three centimeters deep in the organizer and put a ruler up against it. The sauce was poured behind the stopper. The stopper was pulled up and the sauce pushed over the ruler. After thirty seconds I stopped the sauce and measured how far it went. After ten trials for each of the four sauces I found Kraft was the thickest.

Project Number: MCS024

Grade: 7

Title: Potential Energy Fetch

Abstract: My cousin has a huge drooling Rottweiler that loves to play fetch. Every time I visit my cousin, his dog is constantly begging for me to throw his slobber infested ball and will not leave me alone until I oblige. I have often wondered if it would be possible to invent a machine where a ball could be deposited and thrown automatically without human (my) intervention. My invention centers on using electrical energy to create potential energy in a spring to launch a tennis ball. When the ball is deposited into the funnel, a limit switch is triggered; setting an actuator into motion that compresses and releases a spring that propels the ball to be retrieved.

Project Number: MCS025

Grade: 7

Title: Real Lemonade vs. Art. Lemonade

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS026

Grade: 8

Title: Yeast In Action!

Abstract: My problem was what type of yeast makes the fluffiest bread? My hypothesis was that Red Star quick rise yeast would work the best. My hypothesis was correct. Fleischmann's active dry yeast came in second. Red Star active dry yeast came in third. As I was doing the experiment I made sure that I put the balloons on at the same time so nothing had a head start. So if you were going to make bread you would want to use Red Star quick rise yeast. But if you were making something that doesn't need much yeast use Fleischmann's.

Project Number: MCS027

Grade: 7

Title: New Golf Technology - Fact or Fiction?

Abstract: Golf companies are rapidly creating technology to improve the game of golf, and this experiment tests Adjustable Weight Drivers against standard drivers. It was hypothesized that the new, more expensive drivers would not work outperform the standard drivers. To obtain an answer to the problem, twenty adult subjects tested four club types five times each in a launch simulator. Measurements were taken for various attributes, including distance, club speed, spin rate and launch angle. The results show that the adjustable weight drivers perform better. Therefore, the hypothesis was incorrect.

Project Number: MCS028

Grade: 8

Title: "Plop Plop Fizz Fizz Oh What a Relief it is?"

Abstract: Antacids are used to help neutralize stomach acid. My project was to find out which antacid works the best. A solution was prepared to simulate the pH level of the human stomach and four different antacids: Mylanta, Rolaids, Pepcid Complete, and Pepto-Bismol. I concluded that Pepcid Complete was the most effective in neutralizing stomach acid out of the four antacids that I tested. Further research on other antacids could extend this study.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS029

Grade: 8

Title: Clearing Clogged Drains

Abstract: I picked my project “What Works Best at Clearing Clogged Drains?” because clogged drains are a common problem in most homes. I hope to prove which recommended solution works the best. For my experiment, I will be testing five variables. I put a clog mixture in the drain and used each solution according to its directions. I cleaned out the drain and did this five times for each variable. In my experiment I concluded that the Ginger Ale worked the best, then Drano, hot water, baking soda & vinegar and finally Zip-It did not work at all.

Project Number: MCS030

Grade: 7

Title: Clorox: Is It Really Best?

Abstract: I wanted to see if Clorox worked better than lemon juice or hydrogen peroxide when it came to getting stains out of white clothing. First, I made three samples of each of the following stains: ketchup, pen ink, eyeshadow, and chocolate. Then, I soaked one sample from each stain in Clorox for twenty minutes. I did the same for the hydrogen peroxide and lemon juice. The stains were then washed in cold water on the regular cycle. Surprisingly, lemon juice worked the best, with Clorox in second. Hydrogen peroxide was the worst, barely removing any of the stains.

Project Number: MCS031

Grade: 8

Title: Which Chocolate Melts Fastest?

Abstract: Different brands of chocolate can take different amounts of time to melt. Different brands of chocolate were placed into a hot water bath and timed until completely melted. The brands tested included Ghirardelli, Mids, Nestle, Disks, and Hershey. Data collected included temperature, time to melt, and color and smoothness of chocolate. Nestle brand chocolate melts the quickest in comparison to the other chocolate brands tested.

Project Number: MCS032

Grade: 7

Title: Strength Test of Plastic Bags

Abstract: I wanted to find the strongest garbage bag. I purchased four different brands of bags. I did background research and formed a hypothesis that Glad would be the strongest. I placed a pole across a ladder (where I hung the bag). I held a garden hose inside of the bag and filled it with water. I put a container underneath the bag to catch the water. I weighed the container on a scale. I recorded the weight each bag held. I concluded that Glad was the strongest bag because it held the most amount of water.

Project Number: MCS033

Grade: 7

Title: The Impact of Coat Construction on Hypothermia

Abstract: The purpose of this study was to determine the best outer fabric and inner filler to use to construct a coat to prevent hypothermia. Phase 1 tested the insulating property of 10 outer fabrics ranging from corduroy to faux fur. Phase II tested the insulating properties of three inner fillers: down, fiberfill and foam. Hypothermia is a serious health risk for the very young and the elderly. Finding the best fabrications to use to construct winter outerwear will help protect consumers from hypothermia.

Project Number: MCS034

Grade: 8

Title: Fire for Fuel

Abstract: The purpose of this experiment is to compare how long different types of wood will burn. If wild black cherry, black locust, and red oak are burned in a Brunco Hearthglow wood furnace, then the black locust will burn the longest. The experimental wood was burned in the furnace and timed. It was started with the same amount of newspaper, fire starter, kindling wood, and matches. Black locust burned the longest, because it has the highest density. The hypothesis was correct.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS035

Grade: 7

Title: Popcorn, Popcorn, Popcorn Who Pops The Best?

Abstract: The problem is "Which microwave popcorn pops the best?" It is hypothesized that "Because there are more kernels in the bag, ACT II will pop the best." Brief procedure of the experiment as follows: First I will pop the popcorn. Next, I will separate the popped and unpopped kernels. I will then put the un-popped kernels on a plate and popped ones in a bowl and count as I go. Next, I will add the total of the kernels together. Last, I will record the data in my log book. The results do not support the hypothesis.

Project Number: MCS036

Grade: 8

Title: Cosmetics Analysis

Abstract: The purpose of my project was to determine by the use of SEM analysis if a difference really exist between varying cosmetics at different costs. The results of this experiment would greatly benefit anyone interested in receiving quality cosmetic products at affordable prices.

Project Number: MCS037

Grade: 8

Title: What's Poppin'?

Abstract: I performed this experiment to find out if storage temperature affected how many kernels were left unpopped in a bag of microwavable popcorn. I first froze 2 bags of popcorn overnight, while leaving the other 2 at room temperature. I then put the popcorn in the microwave, and when finished, I counted the number of kernels left unpopped in each bag. In both trials, the popcorn left frozen left more kernels unpopped than the popcorn stored at room temperature. I concluded that leaving popcorn at room temperature is the best way to get the most out of your popcorn.

Project Number: MCS038

Grade: 8

Title: hyper hyper hyper

Abstract: My science project is about how energy drinks have effects on your blood pressure(monster,red bull,full throttle,full throttle fury,water,and gatoraid.)you get 7 different student and then give them 50ml of there enery frink and monafide there blood pressure

Project Number: MCS039

Grade: 7

Title: The Papertowel Challenge

Abstract: I set out to prove which of the four brands of paper towels I picked was the most absorbent. I chose three brand names and one generic. I performed three trials on each paper towel brand. I proceeded to test them by pouring the same measured amounts of water in a basin for each paper towel. Then I submerged completely each brand for 20 seconds, then lifted it out and let drip for 30 seconds. I then calculated the paper towels absorbency with the amount of water left over. To my surprise I found out that the generic towel was the most absorbent of the four brands.

Project Number: MCS040

Grade: 7

Title: How Sunglasses Handle UV Rays

Abstract: The purpose of this investigation is to determine which types of sunglasses keep out the most UV rays. During this investigation filter paper was dyed. Sunglasses were placed over the paper and placed under a different type of light for 15 min. After 15 min. the paper was rinsed under water and placed in hydrogen peroxide, then depped in water. The sunglasses F, D, and G were accurate at keeping out UV rays. The hypothesis, if sunglasses are used to block out ultraviolet rays, then the more expensive pair will block out the rays more than any other pair, was not supported by the data.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS041

Grade: 7

Title: The Trash Bag Challenge

Abstract: The problem was which trash bag brand was the strongest. I compared 4 brands of trash bags. I cut samples of each bag into 8 by 30 centimeter pieces. I rolled each sample around a pencil, leaving 3 centimeters. I had people pull on the samples. I then measured how far the sample stretched before it tore. Glad brand of trash bags were the strongest.

Project Number: MCS042

Grade: 7

Title: "Will the Cheap One Work?"

Abstract: The purpose of my project was to determine if the cheap detergent would remove the coffee stain from the cotton fabric better than expensive detergent. My procedure included first, staining cotton piece number one with coffee, washing it with a half cap full of Tide detergent per three gallon of water and lay cotton piece out to dry. I repeated these steps with cotton peices two and three with different detergents and the same measurements. Tide left the fabric the cleanest but Solo and All came close to working just as well. So, "Will the Cheap One Work?" Yes, but it requires a little extra effort!

Project Number: MCS043

Grade: 7

Title: Distance vs. Ball Covers

Abstract: The purpose of this experiment was to see if soccer balls covered in different materials varied in average distance if kicked at the same force. The hypothesis was if a kicking machine kicks four soccer balls with different coverings, then the Brine Prodigy Attack soccer ball will travel the farthest because it has the hardest covering. To perform this experiment, each soccer ball was placed on a kicking machine and kicked ten times. The distance each traveled was measured and averaged. The adidas OMB Club soccer ball had the farthest average distance. In conclusion, the hypothesis was incorrect.

Project Number: MCS044

Grade: 8

Title: Portion Distortion

Abstract: In general, do people eat too much during a meal? Is it more important to be concerned with what we eat or how much we eat? Does overeating contribute to the high incidence of obesity in Americans? I ask these questions because although I understand the importance of eating healthy I wanted to investigate the reasons I believe obesity could be so high in America, learn from this experiment, and then share my findings with the class. My guess before beginning this project was that overeating causes obesity. Every American wants to feel that they have gotten what they pay for when they go to the restaurant. Therefore, the restaurants serve larger sizes and many fast-food restaurants give you the option to "supersize" for only a small amount more of money. For this experiment I visited three popular fast-food restaurants and purchased my favorite meals from them. I visited McDonalds, Wendys, and Subway. I collected the nutritional data on everything that I ordered. With the help of my mother, I then mimicked the meals at home only I prepared the meals according to the standard single serving size according to the Food Guide Pyramid. I compared all of the nutritional data of the meals, I took pictures of the meals, I weighed and measured the items of food, and I observed the differences in sizes for what each restaurant considered "small" or "single-serving".

Project Number: MCS045

Grade: 7

Title: Comparing Battery Life

Abstract: The purpose of this investigation was to determine if brand name batteries last longer than generic brands. The materials used were tap lights, Energizer, Duracell, Energizer Lithium, and generic batteries. The tap lights were turned on for 3 days until they burned out. Energizer Lithium lasted the longest at 24 hours.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS046

Grade: 7

Title: Mouthwash - It;s Effects

Abstract: A procedure of the experiment follows. I put 1tbs. of Knox gelatin into the Petri dishes. I wiped the inside of my mom's mouth six times and wiped the q-tips into the Petri dishes and waited for the bacteria to grow. when the bacteria was grown I used a medicine dropper filled with each one of the mouthwashes onto every one of the Petri dishes. I put them back into the refrigerator for one day so that the different types of the mouthwash could start to disinfecting the bacteria. I repeated the steps above for two days. I waited one more day for the last of the mouthwash to affect the bacteria. I compared the pictures by the ones that worked the best. The results didn't support my hypothesis.

Project Number: MCS047

Grade: 7

Title: "In the Swing of Things"

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS048

Grade: 8

Title: Dirty Spinach, Clean Lettuce

Abstract: Motivated by the recent E. coli food poisoning caused by fresh spinach, I tested leaf spinach and salad, intended for consumption, for their bacterial content. Compared to salads bacterial content of spinach was lower by two logs (salad washed: 2×10^6 colonies/gm produce, unwashed: 3×10^8 colonies; spinach washed: 1.8×10^8 , unwashed: 2.6×10^8). The bacterial content of home-grown salad (2.4×10^4) and spinach (2.4×10^4) was substantially lower than that of store-bought produce. The washing of leafy spinach and salads appears ineffective to reduce bacterial contamination.

Project Number: MCS049

Grade: 8

Title: Noise: A Thing of the Past

Abstract: Just how well does a noise-cancellation device work? This experiment intended to determine in which type of situation a noise-cancellation device would perform the best. A decibel meter was placed inside a simulated head. Next, five trials of three different noises (road, lawnmower, and car engine noise) were played from three different distances. The results showed that the noise-cancellation device performed the best for lawnmower noise. My analysis was that the device performed the best for lawnmower noise because it had a low pitch and it was constant. In conclusion, my hypothesis was shown to be incorrect.

Project Number: MCS050

Grade: 7

Title: The Effect of Stain Removers

Abstract: Please visit exhibit for student's abstract.

Project Number: MCS051

Grade: 7

Title: The Durability of Paint

Abstract: Which paint will chip the least in a simulation of the elements? This experiment addressed that question. It was hypothesized that the most expensive paint would yield the best results because it would have the most durable ingredients. Four different paints were painted on blocks of wood. The experimental group was placed in a freezer, put under a heat lamp, treated by a steamer, and then compared to the control group. A grid containing one-hundred blocks was placed over the blocks to measure the damage done to the paint. The most expensive paint performed the worst, proving the hypothesis incorrect.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS051

Grade: 7

Title: The Durability of Paint

Abstract: Which paint will chip the least in a simulation of the elements? This experiment addressed that question. It was hypothesized that the most expensive paint would yield the best results because it would have the most durable ingredients. Four different paints were painted on blocks of wood. The experimental group was placed in a freezer, put under a heat lamp, treated by a steamer, and then compared to the control group. A grid containing one-hundred blocks was placed over the blocks to measure the damage done to the paint. The most expensive paint performed the worst, proving the hypothesis incorrect.

Project Number: MCS052

Grade: 8

Title: Let There Be Light

Abstract: The type of lighting in your home can be a budget breaker or a money saver. A forty-watt incandescent bulb, a forty-watt fluorescent bulb, and an eleven-watt fluorescent bulb were all tested to compare brightness, energy usage, and cost. The eleven-watt fluorescent emits two hundred and forty more lumens than the incandescent light lasting seven times longer. The forty-watt fluorescent light gave off an incomparable amount of lumens but used the same amount of amperage as the incandescent bulb. This research shows that an eleven-watt fluorescent light is most efficient.

Project Number: MCS053

Grade: 7

Title: Do You Dress Right?

Abstract: If several layers of fabric and one layer of wool are tested for insulation ability, then the several layers will hold the most heat, because there are more layers for air to be trapped. Fabrics such as: wool, cotton, denim, polyester, flannel and felt, were tested by wrapping them around a jar containing boiling water and taking the temperature every 30 minutes. Testing showed that one layer of wool held the most heat the longest, followed closely by the five and four layer jar.

Project Number: MCS054

Grade: 7

Title: Do Storage Methods Affect Battery Life?

Abstract: Will batteries last longer if you store them a certain way? The investigator hypothesized that batteries stored in their original packages in the refrigerator will last longer and this will be true for expensive and inexpensive brands. Two brands of AA alkaline batteries, Panasonic (least expensive) and Duracell Coppertop (most expensive), were stored for 30 days in six different ways: room temperature in original package, room temperature opened, room temperature opened and placed in zip lock bag, refrigerator in original package, refrigerator opened and refrigerator opened and placed in zip lock bag. Batteries were then placed in flashlights, run until dead, tested with a voltmeter and timed. Research showed that temperature can slow down or speed up the chemical reaction in the battery. The hypothesis was partly correct. Both expensive and inexpensive batteries performed better when stored in the refrigerator. However, placing the batteries in a zip lock bag in the refrigerator produced the best results on average.

Project Number: MCS055

Grade: 7

Title: It's a Bust!

Abstract: Which garbage bag is strongest? The experimenter will first label each brand of garbage bag with the appropriate label. Then she will test the first brand of garbage bag by dropping a 6.12kg bowling ball into the bag repeatedly until the bag breaks. She will then repeat this process two more times for the two other garbage bags of the same brand. Next, she will test the other three brands of garbage bags the same way as the first. The experimenter will then record all data in observation notebook. She will then proceed to create graphs of the data recorded.

INTERMEDIATE DIVISION – CONSUMER SCIENCE

Project Number: MCS056

Grade: 7

Title: Munching on Some Iron

Abstract: The purpose for my project was it's important to have iron in cereal. My procedure is to crush the cereal and add warm water. I stirred each cereal with the magnet for 3 minutes. Afterwards, I removed the magnet and weighed the filings on a scale. Total's iron filings weighed 1 gram, the other cereals iron didn't weigh anything, which was a problem. So, I figured every mm of filings on the magnet was 10% filled. The cereal with the most iron was Total, the one with the least was Pops. I concluded that my hypothesis was supported. As for going further in my project I would test more cereals and use a better scale

Project Number: MCS057

Grade: 7

Title: Clean is Clean, If You Know What I Mean.

Abstract: The purpose of this experiment was to find out which laundry detergent gets stains out the best. I cut pieces of the same material. Marked each according to the brand of detergent used. I pre-washed each piece. Stained each with chocolate sauce and ketchup. Let the stain sit for 60 minutes. I washed each piece of stained material in each designated detergent. Let them air dry. Then tested for whiteness visually as well as mechanically. Tide cleaned the best.

Project Number: MCS058

Grade: 8

Title: Don't Sweat It!

Abstract: This project was performed in order to determine which fabric is better for wicking away sweat from the body during sports. Special sports performance fabrics were tested against cotton. Three milliliters of water was dropped onto the fabric, and it was massed every five minutes for thirty minutes. Each time the experiment was done, the sports performance wear performed the best. The data was put into a table and the average mass lost was calculated and graphed. The sports performance wear, Ativa, worked the best because it evaporated the water quicker than any other fabrics tested.

Project Number: MCS059

Grade: 8

Title: Does Wash Reduce Flame Retard Cotton

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES001

Grade: 8

Title: Which Soil Gets an A+?

Abstract: In this project, I determined which soil on our farm had the best nutritional composition and what amounts of nutrients were needed to reach the optimum levels. The project involved testing soil samples for macronutrients. The test was performed with “The Simplex Soil Testing Kit” and a pH meter to find the pH level. The results of these tests were then put into charts and calculations were made as to the proper amounts of each macronutrient needed. The results proved my hypothesis to be correct. It was determined that the soils of different croplands needed different amounts of nutrients.

Project Number: MES002

Grade: 8

Title: The Cutting Edge

Abstract: Please visit exhibit for student's abstract.

Project Number: MES003

Grade: 8

Title: Nitrates on the Growth of Algae

Abstract: In this experiment I tested different levels of nitrates in reaction with algae. In doing so I hoped to see the harmful effects of eutrophication and investigate the overall effect of nitrates on growth of algae. To run the experiment, I made the different concentrations of fertilizer solution and made 3 test tubes for each concentration. I then placed 10 drops of algae culture in each test tube and let the algae grow for 3 weeks. I recorded by observations. It turned out that the 4.5% and the 9% solutions grew the most algae.

Project Number: MES004

Grade: 7

Title: Magnetic Compass

Abstract: Please visit exhibit for student's abstract.

Project Number: MES005

Grade: 7

Title: How Temperature Affects Magnetic Strength

Abstract: The purpose of the experiment was to test magnetic strength at different temperatures. I used boiling water, magnets, ice and a spring scale. At three separate temperatures (18°, 70°, 212°), I observed how many newtons it took to separate them.

Project Number: MES006

Grade: 7

Title: Detergents; Good or Bad?

Abstract: The experiment tested detergents with phosphates and environmentally safe detergents. The detergents were mixed with water and put into separate containers, water plants were added. The visibility of the water, growth of algae, and plant's statuses were recorded. This experiment's purpose was to see if environmentally safe detergents are environmentally safe. There was a control with no detergents, in this container nothing happened. In the container with environmentally safe detergents the plants died, the visibility dropped, and there was a large increase in algae, as with the container with phosphate detergent. It was concluded that environmentally safe detergent doesn't seem environmentally safe.

Project Number: MES007

Grade: 7

Title: Vegetation and Erosion

Abstract: The purpose of this investigation was to determine if vegetation affects erosion. Grass was planted into 3 pans and was grown for 2 weeks. After 2 weeks, the pans were elevated and water was poured over the pans. The amount of soil with vegetation moved 3.81 cm. in pan 1, 6.35 cm. in pan 2, and 5.08 cm. in pan 3 with an average of 5.08 cm. In the pans of soil without vegetation the soil moved 9.35 cm. in pan 1, 9.21 cm. in pan 2, and 9.53 cm. in pan 3 with an average of 9.42 cm.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES009

Grade: 8

Title: Crater Size vs. Size and Angle

Abstract: Please visit exhibit for student's abstract.

Project Number: MES010

Grade: 7

Title: Let It Burn

Abstract: This experiment is to see how long certain candles burn in different environments. A container, votive, and taper candle were placed in an indoor and outdoor spot and were lit. The candles outside blew out quickly while the ones indoor stayed alight. The container candle used the most wax and the taper used the least. It is concluded that larger candles use more wax, and candles get blown out by the wind because the candles cannot get the oxygen they need from the moving air.

Project Number: MES011

Grade: 8

Title: The Lifetime of Black Holes

Abstract: Please visit exhibit for student's abstract.

Project Number: MES012

Grade: 7

Title: which bulbs will sprout first

Abstract: Please visit exhibit for student's abstract.

Project Number: MES013

Grade: 8

Title: Lets Get Ready to Tumble

Abstract: Earthquakes are an unstoppable force that no one can predict. I conducted this experiment to determine the effect of building height on the amount of earthquake damage. I built a shaker table used to simulate the shaking of an earthquake. Then I cut 3-inch by 4-inch blocks out of Styrofoam. The seven level building lost the largest average of walls. Future tests could be how long it takes for different size buildings to collapse.

Project Number: MES014

Grade: 8

Title: Effect of Design and Cleaning on the Power of Solar Cells

Abstract: The purpose of this research was to see what design of solar lamp is most effective in converting solar energy absorbed in the day to light at night. In addition, the impact of a cleaning program on the effectiveness of photovoltaic cells also was investigated.

Project Number: MES015

Grade: 8

Title: Heart Rate vs. Pollutants

Abstract: Please visit exhibit for student's abstract.

Project Number: MES016

Grade: 8

Title: Sand Baggin' It

Abstract: The purpose of this experiment is to discover what kind of material works best in a polypropylene woven bag. The procedure used was to fill the bag with 400 grams of fill mixture. Pour onto the bag 400 ml of water, record the total amount of water left in the beaker. Repeat the steps for all materials. The data that was obtained from all of the experiments was that it is not the mixture but the bag itself that does the retaining. After the testing of four mixtures the amount of water retained was very similar in all tests.

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

Project Number: MES017

Grade: 8

Title: Soil Types and Runoff

Abstract: Please visit exhibit for student's abstract.

Project Number: MES018

Grade: 7

Title: Which Materials Best Dissolve Snow?

Abstract: Pittsburgh has the strangest weather. One day the sun is shining bright. The next day it's snowing and the temperatures below freezing. Whenever it snows it either snows hard or gently. Either way, the salt truck always comes out ready to clear the streets of snow. To clear the streets they use calcium chloride. Even though it clears the streets, calcium chloride leaves streaks on the pavement, and animals could eat the ones that aren't crushed. I decided to find out if we could use another product that was equally productive but less harmful. I decided to test my experiment by gathering snow and seeing which material out of Gatorade, seltzer water, boiling water and calcium chloride melted the most snow. I realized that even though calcium chloride leaves streaks and can be eaten by animals it is the most effective. While the others froze, calcium chloride stayed crumbled and never froze

Project Number: MES019

Grade: 8

Title: Effect of Pollutants on Lemna minor

Abstract: Please visit exhibit for student's abstract.

Project Number: MES020

Grade: 7

Title: Soil Erosion

Abstract: Soil erosion occurs by ice, wind, and water. I intended to investigate which soil material would erode the fastest by water. I placed each type of soil in a pan and poured water on top of it. After the water drained, I recorded the results on a chart. When I finished my experiment, I concluded that topsoil eroded the most. I suggest that you don't use topsoil for landscaping or soil erosion will occur unless stabilized by grass or a ground covering.

Project Number: MES021

Grade: 7

Title: Peatmoss vs. Topsoil

Abstract: Problem - lack of fertile farmland; will plants grow well in peatmoss. Hypothesis - plants in peatmoss will die (lack necessary nutrients); plants in topsoil will thrive (possess necessary nutrients). Materials – flowerpots; topsoil; peatmoss; Gro-Light; bean seeds; stones; spray bottle; water. Procedure - put stones in flowerpots; fill some flowerpots with topsoil and other flowerpots with peatmoss; plant seeds; water and shine light on seeds each day; approximately every 5 days measure plant growth. Data - match each variable and control specimens; record plant germination and growth; graph results; take pictures. Conclusion - plants in peatmoss have a slower growth rate and are not as tall; plants in topsoil grow faster and taller.

Project Number: MES022

Grade: 8

Title: Fluor. vs Black Light Effects On Grass

Abstract: Please visit exhibit for student's abstract.

Project Number: MES023

Grade: 8

Title: Down the Drain

Abstract: I chose this project to see if my family was using the best toilet paper. It turns out that we were using the paper that broke up the best. I tested my question by simulating a flush of a toilet by shaking a jar for one minute. Then I waited two days and recorded my results. The paper products were most absorbent

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

to best broken up in this order: tissue, Cottonelle wet wipes, Charmin Fresh mates, napkin, Quilted Northern Super Absorbent, Charmin Ultra, Quilted Northern Ultra, and Scott. I found out that some companies advertise for absorbency, not "septic safety".

Project Number: MES024

Grade: 7

Title: The Dissolving Rate of a Pill

Abstract: The purpose of my experiment was to test the solubility of a children's vitamin. I dissolved the vitamin in three different liquids: water, apple juice, and ginger ale. I did each of these under three different conditions: stirred solution, crushed pill, and undisturbed. The data showed that the pill dissolved the fastest in ginger when it was undisturbed. It dissolved the fastest in water when it was stirred and it dissolved the fastest in apple juice when it was crushed. I concluded that overall the pill dissolved the fastest in apple juice when the pill was crushed.

Project Number: MES025

Grade: 8

Title: Gas Stations vs. Soil Contamination

Abstract: I selected this particular project because I was interested in testing to see if gas station underground tanks were leaking and contaminating the soil around them. My hope was to prove that my hypothesis was correct, however, the obvious result was not so obvious. There were factors that could have affected the outcome. Experimentation included soil collection, swabbing Petri dishes, incubating them, counting bacterial colonies and pH testing on soil samples. End results showed that backyard soil yielded the most bacteria, as opposed to gas stations soils, which would not have been my scientific opinion.

Project Number: MES026

Grade: 7

Title: Effect of Antifreeze on Radish Seed

Abstract: Antifreeze is a potential environmental toxin that can easily enter the environment of plants and animals. The purpose of the project was to determine the effects of different types of antifreeze, specifically regular antifreeze and low toxicity antifreeze, on the germination and growth of radish seeds. 1% and 5% solutions of each antifreeze and a control solution were tested on groups of five petri dishes each containing 20 radish seeds. Seeds were observed daily for germination. After 5 days, percent germination was 92% (control), 87% (1% low tox), 31% (5% low tox), 6% (1% regular), and 0% (5% regular).

Project Number: MES027

Grade: 7

Title: What is the Best Plant Growth Media?

Abstract: The purpose of this experiment was to find out in which type of media plants would grow the best. I planted nine snapdragons in potting soil, Agrosoak ((plant gel), and water. I recorded the number and condition of flowers and buds on each plant. The plants in the Agrosoak had the best overall appearance.

Project Number: MES027

Grade: 7

Title: What is the Best Plant Growth Media?

Abstract: The purpose of this experiment was to find out in which type of media plants would grow the best. I planted nine snapdragons in potting soil, Agrosoak ((plant gel), and water. I recorded the number and condition of flowers and buds on each plant. The plants in the Agrosoak had the best overall appearance.

Project Number: MES028

Grade: 8

Title: Air and Atmospheric Pressure

Abstract: The purpose of this project is to study the relationship between temperature, volume and pressure. I carried out three experiments that prove air expands when it is heated and cold air produces the low pressure. First experiment – Add the hot water in a plastic water bottle, shook the bottle for a few

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

seconds, and then remove the water. Then, immediately shut the bottle top. Now, see that the bottle will crumple up. Second experiment – Take a deep pan, put a candle in the center of a deep pan and light it up. And then fill the surroundings with water. Then put a glass cup on top of the candle and notice that the water level rises. Third experiment – Light a piece of paper, put it in a glass cup, and then watch the fire go out. Then, put a balloon on top of it and you will see that it will get stuck to the cup. I figured out that warm air does expand when it is heated and that when air cools, it creates an area of low pressure.

Project Number: MES029

Grade: 8

Title: What soil is best for water retention?

Abstract: This experiment evaluated water retention properties of five different soils. These soils were weighed and three hundred milliliters of water were poured into each container and the following was recorded; time taken for water to begin leaking out, time taken for water to finish emptying into the beaker, and amount of water that passed through the soil. The data showed water leaked out of home soil the fastest, top and home soils emptied the fastest, and topsoil retained the most water. Water was absorbed in soils that had larger particles and water flowed greatest in soils with larger air spaces.

Project Number: MES030

Grade: 7

Title: The Effects of Herbicides on Seed Growth

Abstract: The purpose of this study was to determine if the concentration of herbicides could be reduced and still be effective at controlling vegetation. Lettuce seed bioassays were conducted using 100%, 50% and 25% concentrations of three popular herbicides. As a result of this research, it was found that consumers could reduce the concentration of herbicides and still effectively control unwanted vegetation. Herbicides are potentially dangerous to our ecosystem and studies that find ways to reduce their use are very valuable.

Project Number: MES031

Grade: 8

Title: Icicle Making

Abstract: Icicles have always fascinated me and I sought to find a technique to make my own. I found that there were several bases that worked very well. Considering the materials at my disposal, there were several complications I could not overcome. I did discover that it was possible, just more complicated than I expected.

Project Number: MES032

Grade: 8

Title: Greens Against Gravity

Abstract: Please visit exhibit for student's abstract.

Project Number: MES033

Grade: 8

Title: Window Glass as Insulation

Abstract: The purpose of this investigation was to determine which type of glass, clear or tinted, insulates the best. Procedures: Obtain all materials; construct apparatus; place each apparatus 30 cm from tip of each light bulb; turn on each lamp; wait 15 min. then record reading from each of 5 thermometers; turn off each lamp after recording reading; repeat for 9 additional trials. The reflective glass was the most effective insulator. The low-e, although not the most effective insulator, would be a very good choice to use in residential windows because it does keep heat out in summer and still permits light to penetrate a room in winter.

Project Number: MES034

Grade: 7

Title: A Study of Deterrents to Keep Birds from Windmills

Abstract: Wind turbines, supported by many as a pollution-free energy source, are under attack by others for killing thousands of birds each year. The purpose of this study was to find a deterrent that would scare

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

birds away from windmills. Objects were placed on birdfeeders to determine if they would repel birds from their food source. Categories of deterrents tested included visuals, sounds and odors. If a deterrent can be found to keep birds away from the blades of a windmill, all environmentalists will be able to support the expansion of windmill farms and help relieve our dependence on oil as an energy source.

Project Number: MES035

Grade: 8

Title: "The Future of Density"

Abstract: I did this experiment to find out if the same size objects with different densities would make bigger or smaller craters. I used a transparent container and dropped the objects from a height of 13 cm and took them out very carefully. I held a golf tee at the very bottom of the crater. I held a marker level to the ground and marked the golf tee. I recorded the results. I did this five times for each object. I recorded the data and averaged it. The results were wood made the smallest crater then cork, the brass, then aluminum, then steel, and iron made the biggest crater. My hypothesis was correct in that the densest was the heaviest.

Project Number: MES036

Grade: 7

Title: Heat Energy:Measuring Conduction

Abstract: I conducted this experiment to determine which material is the best conductor of heat. I placed one piece of butter onto three ten centimeter lengths of eighteen gauge copper wire, aluminum wire, steel wire, and a wooden dowel rod. One glass bead was placed into each piece of butter. The conducting materials were secured to a glass bowl with clay. Hot tap water was poured into the bowl. The time it took for the butter to melt and the bead to fall was recorded. My hypothesis stated that copper wire would conduct heat the fastest. This was supported by the data.

Project Number: MES037

Grade: 7

Title: Force Transfer in Saturated Soil

Abstract: It is known that the liquefaction of saturated soils has been the cause of structure damage during seismic events such as earthquakes. The purpose of this experiment is to determine what effect soil additives have on the transfer of weight through saturated soil and which additives are most effective on lessening the effects of soil liquefaction. The soil used in this experiment was local Redbed, suspected of liquefying during recent construction blasting on Route 65 Kilbuck Township. The soil additives were: dried bark, dried leaves, Styrofoam popcorn, and granular polymers. The soil with each additive was saturated in PVC pipes. Dowel rods were inserted horizontally through the pipe at specified intervals. Seismic activity was simulated. Soil compaction was measured by pulling out the dowel rods with a spring scale. It was determined that soil liquefaction was minimized by soil additives and that granular polymers were most effective in lessening soil compaction.

Project Number: MES038

Grade: 8

Title: Clean up that oil!

Abstract: The reason I chose this topic is because I have noticed that oily substances are a pain to clean up. I started to wonder if there was anything that was best at cleaning it up. I tried cotton balls, hair, nylon, paper towels, yarn and feathers. I put .5 grams of each into the 15 ml of oil to see how much they could absorb. The cotton balls ended up doing the best, and the nylon did the worst. Those results were very close to what I expected because I thought the cotton balls would do the best.

Project Number: MES039

Grade: 7

Title: Volcanoes

Abstract: The problem is, will the different ingredients I use affect the eruption of the volcanoes? It is hypothesized that the mixture of yeast and hydrogen peroxide will make the largest volcanic eruption. A brief procedure of the experiment is as follows: The first mixture was with lemon juice. It was slow and foamy and it ran out very slowly down the volcano. The next mixture was with vinegar and it was quicker with

INTERMEDIATE DIVISION – EARTH/SPACE/ENVIRONMENT

bigger bubbles. The third was yeast and peroxide. This mix was very strong and came out quickly with the biggest bubbles. The results do support the hypothesis.

Project Number: MES041

Grade: 8

Title: What Temperature Do Crystals Grow Best?

Abstract: My project is to determine at which temperature crystals grow best. The steps are: make the solution of table salt, water and food coloring; record temperatures of the areas selected (a bedroom, a basement and a refrigerator); place solutions on the scale and weigh to find the heaviest crystal. Repeat procedure for two more weeks. My hypothesis was proven incorrect after one week. Due to the low humidity in the basement area the crystals grew best in moderate temperatures, not in cold temperatures as I predicted.

Project Number: MES042

Grade: 8

Title: Which Way's Up?

Abstract: The purpose of this project was to see if seeds are confused when rotated, which is important to know when a seed is accidentally moved. The hypothesis was If a radish seed is turned ninety degrees to the left every twelve hours, then its roots will still grow toward gravity because plants can orient themselves based on gravitropism. Radish seeds were rotated twice a day and compared to ones that were not rotated. The roots were measured after two days' growth. The experimental group grew more than the control, so the hypothesis was proven true.

Project Number: MES043

Grade: 8

Title: S. L., S. B., H. M. S. C. Y. S. T.

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER001

Grade: 7

Title: Roving Robots

Abstract: Please visit exhibit for student's abstract.

Project Number: MER002

Grade: 8

Title: Parachute Drop

Abstract: The purpose of this project was to see how air resistance affects parachutes. The hypothesis was that if a rock falls from 3.6 meters with a plastic bag as its center cell, then it would fall slower than a rock with a brown paper bag as its center cell because the plastic bag would create more air resistance. I tested paper towels, tissue paper, plastic bags, brown paper bags and napkins as center cells to see which fell the slowest. The tissue paper and paper towel created the most air resistance and fell the slowest. My hypothesis was proved incorrect.

Project Number: MER003

Grade: 8

Title: Which Bridge Would You Drive Over?

Abstract: The experiment that was conducted was to try and find out which of three types of tensioning was the strongest and most efficient. I tested reinforced beam, post tensioned concrete, and non reinforced concrete. In the process of doing this, the experimenter needed to create a mold and fill it with concrete. Once the mold had dried for several days, it was ready to be tested. This was done by applying pressure to the bridge while using a deer scale to measure the amount of mass that broke the bridge. The end result of my experiment was quite a surprise to me. The reinforced beam was proven to be the strongest type of tensioning out of all three

Project Number: MER004

Grade: 8

Title: Stress Point

Abstract: My question was, which metal has the most elasticity? The metals I tested were titanium, copper, inconel, stainless steel, and carbon steel. The reason I chose this experiment was because for the last two years, I have tested experiments involving four of these metals, and I was interested in discovering more about their properties.

The materials I used were a carpenter's level, a machinist ruler, three types of each metal rod used, a weight, a piece of string, and S-hook, paper and pencil, and a holding fixture. The first step in my procedure was to gather all materials. Next, I cut a piece of string to a length of 10cm. I looped the bottom end of the string around the S-hook, and placed the metal so that it stretched over an open space, leaving both ends on the holding fixture but the middle over air. The string was hanging down. I tied the string around the weight, let go, and waited several seconds. What I observed was the metals bending down in their holding fixture. Using the machinist ruler, I measured the bend of the metal. I recorded my results, then redid the process for each trial, and repeated each step for each metal.

Project Number: MER005

Grade: 7

Title: Which battery is the most efficient?

Abstract: I am conducting a science fair project to determine which brand of batteries is the most efficient. To obtain my data, I ran Energizer Max, Rayovac, Duracell Coppertop, and Radio Shack Enercell batteries in sizes of AAA, AA, C, and D through a circuit with a total resistance of .235 ohms until they drained to .100 volt. Then I took the average of the time that each brand of batteries lasted and divided by the MSRP for those batteries to obtain data that I can compare to obtain accurate efficiencies. I have not yet finished testing, so I do not yet have a conclusion.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER007

Grade: 8

Title: Crossbeam Structure!

Abstract: Crossbeams are found in buildings all over the world. This work is intended to show that, crossbeams make a structure support more weight. Two structures were built one with crossbeams, and one without. Bricks were placed on the tops of each structure. It was determined that the structure with crossbeams held more weight than the structure that did not contain crossbeams. Future work is intended to determine what kinds of crossbeams are more efficient.

Project Number: MER008

Grade: 8

Title: Which Windmill?

Abstract: The purpose of this experiment was to test the possibility of creating a new windmill design. Two different windmill frames were created in conjunction with a small electromagnetic generator. A unique two bladed windmill produced more volts than a many bladed design. This engineering project would be useful for electricity production.

Project Number: MER009

Grade: 8

Title: When the Wind Blows

Abstract: Windmills are a major source of power across the world. This experiment was intended to determine the effect of blade design on windmill efficiency. Three different blade designs were placed on a small model windmill and the amount of voltage at one minute was recorded. It was determined that the square shaped blades produced the most voltage: no significant power difference was observed. Literature implies that the area of the blades affect the efficiency. Future work is intended to determine if different sized square blades creates a more efficient windmill.

Project Number: MER010

Grade: 7

Title: L.E.D. Bright

Abstract: Light Emitting Diodes (L.E.D.) are used in a variety of everyday products. This experiment intended to understand how current affects the brightness of L.E.D.'s. By understanding the inverse relationship between current and resistance as stated in Ohm's Law, three different resistors are used to limit current to ten sample L.E.D.'s. Brightness was measured and Ohm's Law held true: for a constant voltage, lower resistance resulted in greater current and brightness. Future work will focus on the conservation of energy by more extensive application of Ohm's Law.

Project Number: MER011

Grade: 8

Title: Height of Freefall

Abstract: The purpose of this investigation was to determine if the height from which eggs are dropped affects the severity of the damage to the eggs. If eggs are placed in a simulated elevator can and dropped down a simulated elevator shaft, then the eggs dropped from the greatest height will display the most damage. An elevator can and shaft apparatus was constructed. Eggs were dropped down the shaft from four different heights. The eggs dropped from the greatest height displayed the most damage. The hypothesis was proven correct.

Project Number: MER012

Grade: 8

Title: Welding Rods and the Strength of a Weld

Abstract: The purpose of my topic was to find out if the cost of a welding rod would affect the strength of the weld it creates. I've always found welding interesting. I hoped to prove that the more expensive rods created the strongest weld. I used five brands of welding rods with the cheapest being the control. I welded two mild steel plates together with each of the brands, and repeated it five times. I bent each weld back and forth with a hydraulic press until the weld snapped. The most expensive performed the worst, and the cheapest performed the third best.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER013

Grade: 7

Title: The Influence of Design on the Strength of the Truss Bridge

Abstract: Since last year, I have experimented with the strengths of different bridge structures and found that the truss to be the strongest. I wanted to see which bridge design was the strongest. I built each bridge out of matchsticks out of the designs of Pratt, Warren with vertical supports, and Warren without vertical supports.

Project Number: MER014

Grade: 7

Title: Strengthening Beam Bridges

Abstract: The purpose for my project is to determine which material laminated to the beam will make the beam stronger in tension or in compression. I laminated each material to the top of the core of the beam testing the beam in compression. I repeated this, on the bottom of the beam testing the beam in tension. I broke each bridge putting 200g on at a time. In tension, balsa wood did the best, holding 3.325kg. In compression, balsa wood again held the most, this time holding 3.125kg. This happened because of the delamination, the glue adhered to each material differently.

Project Number: MER015

Grade: 7

Title: Does the Mass Really Matter?

Abstract: To determine if the mass of the head of the hammer will generate different forces. I created a fixture that will allow the hammer to rotate on a fixed point and apply the same kind of force each time. Set up a control series of 10 nails by setting the nail at a pre-determined height into the pre-drilled holes. Set a pre-weighed head along the handle, measure the distance. Hold the hammer in a vertical position and allow to swing once, impacting the nail. Increase the hammer mass. Repeat the impact process. The mass of the hammer does make a difference on the impact.

Project Number: MER016

Grade: 8

Title: Lighting a House with 1 Lightbulb

Abstract: The purpose of this experiment was to determine if sufficient amounts of light could be supplied to an entire house by the use of one light bulb and multiple fiber optical cables. The results of this experiment would greatly benefit individuals by reducing energy costs as well as overall energy usage throughout the world.

Project Number: MER017

Grade: 7

Title: Friction/Elasticity of Materials

Abstract: The experiment's purpose was to determine which materials would slow the descent of a basketball yet retain its bounceability. Basketballs were covered with various materials, with the nylon covered basketball's descent taking longer down a hill, and still retain approximately the same elasticity of a regular basketball. Devices were created to roll and bounce the basketballs in tests ten times. It was determined the control ball had the most bounces, while the wool ball took the longest. The conclusion provided confirmation that the nylon covered basketball was in the middle of the results of all tests.

Project Number: MER018

Grade: 8

Title: Affect Sawdust: H2O on Pykrete Strength

Abstract: The purpose of my experiment was to test which ratio of sawdust in pykrete was strongest. Pykrete is a frozen mixture of sawdust and ice. I tested a 0% mixture, 7% mixture, and a 14% mixture. To test them, I would stick a 200 millimeter wide, 30 millimeter thick piece of pykrete between two surfaces. I would then put a small piece of wood on its center and hang a bucket off of it. I would fill the bucket with sand until it broke. Overall, the 14% mixture proved to be the strongest.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER019

Grade: 7

Title: Volume of Music

Abstract: I was creating an instrument. I wanted to know if a reed or a mouthpiece would make a better sound. I tested the mouthpiece, recording it. I then used the reed with a saxophone neck and recorded it. I then uploaded the sound to my computer and recorded the music.

Project Number: MER020

Grade: 8

Title: How Interference Affects a Connection

Abstract: I selected my experiment to learn more about the wireless world. I hoped to prove that interference is present when two devices that operate in the same range come into contact. To test the laptop in my project, I would ping an outside device from a laptop while placing a call on a cordless phone, then record what happened to the connection. To test my PDA I would ping an outside device while transferring a file to the PDA. I would record what happened. I proved my hypothesis correct, that interference does occur when the devices are close.

Project Number: MER021

Grade: 7

Title: Paintball Accuracy

Abstract: The purpose of this experiment is to figure out what length of paintball barrel would be the most accurate if tested. The hypothesis was if paintballs are shot out of different length barrels, the shortest barrel will be the most accurate because there is not enough time for the paintball to produce drag. The materials used for this project were plastic pipes, a chronograph, a piece of wood, an air compressor, and a launching mechanism. To conduct the experiment, 40 paintballs were graphed and fired at the wood. The results showed that the four foot barrel was the most accurate.

Project Number: MER022

Grade: 7

Title: Parachute Shape and Drift

Abstract: This project has to do with parachute shape and drift. The purpose of this was to find out which parachutes would have the least amount of drift. The hypothesis stated if the shape of parachute is changed, then the rectangle shaped parachute will have the least amount of drift because the amount of air that causes it to rise. It was done by building the parachute, setting the rockets off, and measuring the distance. The circle parachute had the least amount of drift, and the hypothesis was wrong. Application would be to buy the rocket with the circle parachute.

Project Number: MER023

Grade: 7

Title: Rocket Powered Skates

Abstract: Cartoon characters are sometimes seen shooting around on rocket propelled skates. I wanted to find out if they are practical. Three characteristics were chosen as deciding factors. I worked out the physics and did three real tests. I found they were impractical because the amount of fuel to move even a short distance was substantial.

Project Number: MER024

Grade: 8

Title: Which Brace Works the Best?

Abstract: Many buildings have different structural braces. The purpose of this investigation was to determine which brace was the strongest. The hypothesis was if the types of structural braces of a hexagonal building were changed, then the ones with "X" braces would hold the most pennies. Materials used were toothpicks, Dots Candies, pennies, a level table and a thin sheet of cardboard. Eight structures were constructed and tested including two of the "X" shaped braces, two same direction diagonal braces, two rotating diagonal braces, and two not braced. The "X" braces held the most, concluding that the hypothesis was correct.

INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

Project Number: MER025

Grade: 7

Title: Recycled Concrete Aditives

Abstract: I did this project to determine if concrete could be strengthened and reinforced by plastic bags. I mixed together the concrete ingredients and let the cylinders cure for a week. I put the cylinders in the concrete compression machine and removed them when they were fractured. I repeated this using 2.54 cm recycled plastic bag strips in the concrete. I discovered that the control mix was stronger than the variable mix. The variable mix withstood an average of 9,472.52 kilopascals. The control mix withstood an average of 20,116.58 kilopascals. My hypothesis, the variable mix would be stronger, was incorrect. To improve my project, I would decrease the amount of plastic bag strips and make the strips smaller.

Project Number: MER026

Grade: 8

Title: Valveless Pulse Jet

Abstract: Valve less pulsejets are simple engines, but it is not always easy to understand how they run. This work intended to learn how the size of the combustion chamber on a pulsejet affects the ability to run and its overall efficiency. There were three different size combustion chambers used in this project: 2 inch x 2 ½ inch, 2 inch x 3 inch, and 2 inch x 4 inches. The various sizes were tested and the efficiency of each was recorded. It was determined that the smallest sized chamber ran the best. The other size combustion chambers did not run efficiently or didn't run at all.

Project Number: MER027

Grade: 8

Title: What is Stronger on Metal - Welds or Bolts?

Abstract: My purpose was to show what is stronger for building structures – welds or bolts. The bolts held about 865 newtons per square centimeter. The welds held about 139 newtons per square centimeter. In conclusion, my hypothesis that welds would be stronger, was incorrect because the bolts were over five times stronger than the welds.

Project Number: MER028

Grade: 8

Title: Strength of Fishing Line @ Various Temps

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH001

Grade: 8

Title: Rising Rising Pop

Abstract: The purpose of this experiment was to determine if caffeine raises blood pressure. The procedure in this experiment was, take the subjects blood pressure before any soda. The subject had to drink a full can of Pepsi, their blood pressure had to be taken 45 minutes later. The same procedure was followed after the second can was drunk. It was determined that caffeine does raise blood pressure. Literature suggest that caffeine does raise blood pressure slightly, but not to a clinically significant level. Future work is planned to determine if a larger amount of caffeine will give a more accurate answer.

Project Number: MMH002

Grade: 7

Title: How Safe is our Milk to Drink?

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH003

Grade: 8

Title: What toothpast inhibits bacteria

Abstract: The purpose of this experiment is to prove that Colgate toothpaste will inhibit more mouth bacteria than Arm and Hammer Complete Care, Crest, and Aquafresh. Based on the results of my trials the zones of inhibition are as follows: Colgate averaged 2.1 mm; Arm and Hammer Complete Care averaged 4.7 mm; Crest averaged 3.4 mm; and Aquafresh averaged 2.3 mm. In conclusion Arm and Hammer Complete Care inhibits the most mouth bacteria and Colgate inhibits the least amount of bacteria. Crest came in second and Aquafresh finished third

Project Number: MMH004

Grade: 8

Title: Effect of Saline Environments on Volvox

Abstract: Purpose: The salinity in many rivers is increasing. I wanted to see if freshwater algae can survive in similar circumstances. Procedure: Independent variable: salinity of medium. Dependant variable: amount of algae. Salinities used in my experiments were 0, 25, 50, 75, 100, and 125% of ocean salinity. Used a colorimeter to measure the amount of Volvox colonies alive. Data/Conclusions: In freshwater the algae continued to grow after day 7. In the 25, 50, 75, 100, and 125% experiments they grew on the first day but then declined on the following days. Volvox can not survive in a saline environment.

Project Number: MMH005

Grade: 7

Title: Alcohol and Motor Impairment

Abstract: The purpose of this experiment is to test whether teenagers/pre-teens have less motor impairment due to alcohol compared to adults. This experiment simulates the effects of alcohol impairment by using "drunk" goggles. Subjects complete a routine on Dance Dance Revolution (a videogame that requires matching of a sequence of dance patterns) with and without the goggles. The videogame program records accuracy data for each subject. This experiment is ongoing; currently 5 adults and 8 teenagers/pre-teens have participated. Results so far show that the adults have a 31.36% decrease in overall accuracy and the teenager/pre-teens have a 33.08% decrease.

Project Number: MMH006

Grade: 8

Title: Effect of Antihistamines on Scud

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH007

Grade: 8

Title: How much bacteria is on money

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Abstract: Money can be as source for bacteria. The purpose of this experiment is to find out how much bacteria is on money. 40 pennies of various ages were placed in a warm area for 72 hours. Research from the American Medical Association found Staphylococcus Aureus on 13% of coins. Pennies contain 97.5% zinc and a 2.5% copper mix. Copper is a algaeicide and bactericide and may prevent the transfer of bacteria onto pennies which are coated with copper.

Project Number: MMH008

Grade: 7

Title: Clean, Clean, Clean

Abstract: My purpose was so people can keep their families safe. For my procedure, I took the object and wiped it with a swab. Then take that swab and rub it in a Petri dish. Next I wiped it with Clorox or Lysol and took that and rubbed it in a Petri dish. I did that with each object. My results were that Lysol killed the most germs. Lysol killed up to 19.13% more germs than Clorox, because nothing grew on the first day. I conclude that Lysol killed the most germs. My hypothesis was denied. I thought that Clorox would kill the most germs.

Project Number: MMH009

Grade: 7

Title: Short Term Memory

Abstract: For this project, I tested one seventh grade girl, one seventh grade boy, one female professor, and one male professor as well as my two parents. The results ended up being that boys remembered more. The conclusion is that my hypothesis was wrong and the experiment ended up being a lot harder than I expected.

Project Number: MMH010

Grade: 8

Title: Would You Like Bacteria With That?

Abstract: The intent of this project was to discover if bacteria was present on the lids of soda pop cans. Samples were taken from three brands of soda (Giant Eagle Root Beer, Pepsi, and Coke) from three locations (Display Case, Box, and Vending Machine). I swabbed each of twenty-seven cans of soda with a sterile applicator and inoculated the Petri dishes, which were then placed into an incubator. Plates with no samples acted as my control. Observations of the Petri dishes inside the incubator were taken at twenty-four, forty-eight, and one hundred-twenty hours. It was determined that cans of Giant Eagle Root Beer taken from all three locations and cans of Pepsi and Coke stored in a vending machine contained the most bacteria.

Project Number: MMH011

Grade: 7

Title: How Clean is Our Silverware?

Abstract: Is there a better way to clean silverware? It is predicted that the dishwasher silverware will have the least bacteria. Collect silverware from 5 different locations and cleaned by different methods. Swab silverware with sterile swabs and sterile water. Swab onto agar plates and incubate for 48 hours. The results did not support the hypothesis. The first trial's spoon washed in the cafeteria was an outlier; otherwise results were consistent with the hypothesis.

Project Number: MMH012

Grade: 8

Title: H₂O Zone

Abstract: My original question was "Is there any harmful affects when reusing water bottles?" I chose this experiment because I had always heard there were bad affects to reusing water bottles, such as bacteria growth. So I came up with this experiment to see if this is true. I hypothesized that the water bottle reused without being washed would have the greatest amount of bacteria. First I leabeled each bottle and handed them out. Bottles 2 & 3 were instructed to reuse their bottles for onw week, when empty, before refilling the bottle they were to wash it out with hot water and soap. Bottles 4 & 5 were instructed to reuse their bottles for one week, when empty, rise with cold water and then refill. Bottle 1 was my control, which water was tested immediately after opening. After one week, 8oz from each bottle was placed in a plastic bag for testing, labeled with their corresponding numbers. Then I dipped Colorimetric Test strips in water for 2 seconds. Next I placed the strip into the palstic bags, the bags were sealed with tape and placed in a dark

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

area at room temperature for 48 hours. Last I checked the strip color against the chart for estimated bacteria growth. In conclusion, my hypothesis was proven wrong. In my results there were no signs of bacteria growth.

Project Number: MMH013

Grade: 8

Title: Effectiveness of SPF

Abstract: The purpose of this experiment is to find the effectiveness of different SPF levels. Make solution of .1g yeast, .1g sugar, and 5mL of water. Incubate 30 minutes. Make serial dilutions to 0.001%. Count number of yeast cells present in 15uL using a hemacytometer. Next spread 25uL yeast solution onto YPD agar. Spread 1g sunscreen on inside of agar lid. Expose plates to UV light for 30 minutes. Recount cells on agar plate. Prepare control without sunscreen and control with black paper instead of sunscreen. Repeat 3 times. Data collected shows the yeast cells increase as the SPF level increases.

Project Number: MMH014

Grade: 7

Title: Food and It's Energy Source

Abstract: My project was to test how foods from different food groups affect how much activity a person could perform without stopping. First, I had to find five willing subjects. Next, I assigned each a food group. I then took each subject into a room and wrote down how many jumping jacks they could perform without resting after eating their regular diet. After that, I had the subjects perform the same activity, except after they ate foods from their assigned food group. Finally, I proved my hypothesis correct. People who eat more meats and proteins in their diets can perform more activity.

Project Number: MMH015

Grade: 8

Title: Depth Perception

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH016

Grade: 8

Title: Comparing Dyspepsia Remedies

Abstract: The purpose of my project was to identify which medication or home remedy was most effective at reducing heartburn (yielding a pH of 4 or above). I used a pH meter to record the pH of one recommended dose of medication or home remedy and then repeated this measurement after adding this dosage to 60 mL of 5% white vinegar (representing stomach acid). The most effective was baking soda. However, I learned through my research that it can be harmful to human systems and prescription medications work better because they control or inhibit acid production in humans.

Project Number: MMH017

Grade: 8

Title: Does the pH of acid affect digestion?

Abstract: My experiment was to determine what pH level of solution would digest protein the most. I added HCl to one of the test tubes until it reached a pH of 4. I added sodium hydroxide into the second test tube until it reached a pH of 10. The third test tube already had a pH of 7. Next I put 4 mL of egg white into the test tubes. At set times I centrifuged the test tubes and used a spectrophotometer to record absorption. The solution with a pH of 7 had the lowest absorption meaning the most digestion occurred.

Project Number: MMH018

Grade: 8

Title: Hard Day's Work Stinks

Abstract: The problem addressed was how daily activities affect your hygiene. The purpose of the project was to see that if a shower was taken in the morning at the completion of daily activities, a lot of bacteria would be present on a person's body compared to a non-active period at night. Four individuals were observed during these periods. Bacteria cultures were grown in Petri dishes for ten days. Areas such as

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

the underarm and ear did not contain the expected bacteria, whereas the less conspicuous area of the navel contained the most bacteria. In general, the hypothesis was correct.

Project Number: MMH019

Grade: 8

Title: Hand Sanitizer, Antibacterial Liquid Soap, Regular Liquid Soap, Which Kills Most Bacteria?

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH020

Grade: 8

Title: "Unseen...Unclean"

Abstract: Bacteria are present on everyone's hands. This experiment was to prove if hand sanitizers take away bacteria or germs. Five different hand sanitizers were tested and results were observed. Ethyl Alcohol and Benzalkonium Chloride were active ingredients. Benzalkonium Chloride removes more bacteria or germs than Ethyl Alcohol. Time and lathering is a factor in both ingredients for them to be successful in all the hand sanitizers.

Project Number: MMH021

Grade: 7

Title: Best Toothbrush Storage Methods

Abstract: Does toothbrush storage method affect the amount of bacteria on it? Brush teeth with 3 toothbrushes. Use a different method of storage for each brush. Swab bacteria from each brush onto an agar plate. First negative control: Swab one unused toothbrush onto plate. Second negative control: Swab sterile water onto plate. Incubate. Record growth: Data: 24 hours-Long cap 62%, Bristle cover-28%, Cupboard-19% 48 hours-long cap-66%, Cupboard-64%, Bristle cover-34%. Sterile water 1%, Toothbrush control 22%. Hypothesis was refuted/supported since the cupboard had the least bacteria (24 hrs) but the bristle cap did by 48 hours.

Project Number: MMH022

Grade: 8

Title: Effectiveness of Facial Cleansers

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH023

Grade: 7

Title: Which swimming event has the highest heart rate: 100 free, 100 back, 100 fly or 100 breast?

Abstract: I've swum for many years, and I've always wanted to know which event has the highest heart rate. My hypothesis was that the 100 yard butterfly has the highest heart rate. I had my group (eight people) swim the 100 yard freestyle, the 100 yard breaststroke, the 100 yard backstroke, and the 100 yard butterfly. I found the average of all of the heart rates, making sure that nothing affected the results. The results were that the 100 yard freestyle has the highest heart rate.

Project Number: MMH024

Grade: 8

Title: The Dissolving Factors of Non-Aspirin Medication

Abstract: The purpose of this project was to determine which pain reliever dissolves fastest, and what temperature of water is ideal to take with your medicine to make it dissolve fastest. Several different types of pain reliever were tested under cool, warm, and hot water temperature and others were placed in lemon juice to simulate the stomach's acids. These trials were then stirred and timed to see which ones dissolved the fastest. This experiment could benefit medical professionals as they would know which medicine would work the fastest to prevent or ease pain.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH025

Grade: 8

Title: Memory over Time

Abstract: The topic for my project is, to what extent is a memory of an event affected by time. My question for this project was, is the memory of an event affected over time and the hypothesis was that the rate of memory recall would decrease over time. For my project, I took eight teenage girls, all from the ages of thirteen to fourteen, and had them watch a video recording of a store robbery. Immediately following the video, I had the volunteers fill out a questionnaire based on the events that took place in the recording. I had them fill out the questionnaire three more times (one day after, three days after, and eight days after, scrambling the questions each time). After compiling the questionnaire results, I formed them into two graphs: one for how many questions each volunteer got right and an average of correct answers for each question. After compiling the data, I have proven my hypothesis correct, that the rate of memory recall did decline over time. I have also found that many of the volunteers answered the questions consistently, without showing any increase or decrease in their recall. Also, it seemed that all of the volunteers answered the same questions right overall: such as colors worn, if the burglar escaped, and gender. Overall, I would say that the project was a success. If I could redo this project, I would have the volunteers take the questionnaire over a long period of time.

Project Number: MMH026

Grade: 8

Title: Surface Cleaners vs E-Coli

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH027

Grade: 8

Title: Vitamin C Patrol

Abstract: My initial question is "Does vitamin C affect mold growth on a fruit?" I wanted to do this project to see if vitamin C can keep away bacteria like mold. I guessed that the vitamin C would act as a defender for the fruit and keep mold away. I thought this because since vitamin C helps keep away illnesses in our body, why can't it help fruit. I was proven wrong. I gathered my materials and started my testing. I tested for a week period and found out what I didn't want to find. The orange and the lemon both grew mold while the lime didn't. The pear grew mold also. In conclusion, my hypothesis was proven wrong. I think that might have happened because of the juiciness of the fruit. If I were to change this experiment I would change the fruits, temperature and the location in which they were sitting.

Project Number: MMH028

Grade: 8

Title: Ergonomic Stress on the Skeletal System

Abstract: My project is about the stress put on the back and shoulders when carrying a backpack. I chose this project because I had back pains after switching backpacks. I hope to prove that backpacks create different amounts of stress on the back. I built a PVC structure and placed weighted backpacks on it to see which one created the most stress. The testing showed that each backpack created different stress amounts. I conclude that the two strap added backpack created the most stress on the shoulders and the one strap crossover backpack created the least stress on the back.

Project Number: MMH029

Grade: 8

Title: Sense and Non-Sense

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH030

Grade: 7

Title: Bug Off!

Abstract: This experiment examined whether bacteria grown from a mouth swab in Petri dishes were best treated with antibiotics, Echinacea, a combination of the two or no treatment at all. Ciprofloxacin alone, and in combination with Echinacea, was the only antibiotic out of the six tested that was effective in killing

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

bacteria and stopping its growth. This shows that there may be a growth in antibiotic resistance to bacteria that typically would be responsive to the other antibiotics. These findings may confirm the need for a substitute for antibiotics instead of Echinacea that will help to combat antibiotic resistance.

Project Number: MMH031

Grade: 8

Title: Natural vs. Prescribed

Abstract: My science fair topic was to see if natural antibacterials are more effective than prescribed pharmaceutical antibiotics. The reason I selected this is because I was curious to see which would be more effective in killing bacteria, also if natural products worked as well as antibiotics. My procedure included using a Petri dish, tea tree oil, amoxicillin, garlic oil, and distilled water. I swabbed my schools water fountains, incubated the bacteria and noted the results. I found that amoxicillin was the most effective.

Project Number: MMH032

Grade: 7

Title: Effect of unscented vs scented handsoaps

Abstract: The purpose was to find out if scented hand sanitizer inhibited more bacteria than unscented. My experimental plan was to first buy the hand sanitizers. Then use micropipette to draw up then spurt out nonpathogenic Staphylococci Epidermis onto the agar plate. Then spread the bacteria. Sterilize tweezers and pick up sensitivity disk and dip into hand sanitizer, then put onto agar plate, four times. Put in incubator for 24 then 48 hours. Measure and record zones of inhibition. Citrus inhibited overall .56953125 centimeters. Original inhibited overall .22415625 centimeters. Morning Fresh inhibited overall .676525 centimeters. Morning Fresh inhibited the most bacteria.

Project Number: MMH033

Grade: 8

Title: Kill The Nutrients, Kill The Plant?

Abstract: Can microbes in the soil effect the growth of mung bean plants? Forty different plants were tested, twenty with microbes and twenty without microbes in the soil. Plants were exposed to the same amount of light and water and were grown for 14 days. Data collected included color of stem and leaves, number of cotyledons and leaves, width of stem and leaves, and the height of the plants. The plants that didn't have microbes in their soil grew taller, were greener but did not survive as long as the plants in the soil with microbes.

Project Number: MMH034

Grade: 8

Title: How Clean is Your Bottle?

Abstract: The purpose of my experiment was to determine whether neglecting to wash a water bottle between uses affects bacteria growth. Subjects were asked to drink a water bottle several times without washing between uses. Swabs were taken from the water bottles and were placed in sterile Petri dishes to grow. This process was repeated many times with different variants including the washing of the water bottle as well as the number of times the bottles were used. I found that the bottles that were not washed between uses produces 30 – 50 percent more bacteria than those who were washed between uses. From this, I concluded that neglecting to wash a water bottle between uses does negatively effect bacteria growth.

Project Number: MMH035

Grade: 8

Title: Hand sanitizer vs. germs

Abstract: Hand sanitizer is used to prevent the spreading of bacteria that cause viruses. The reason I did this experiment is because I get frequent colds, and I wanted to find the brand of hand sanitizer that reduces the most germs. An incubator was made and a sample of each brand was placed into it. The amount of germ colonies was recorded after twenty-four hours and forty-eight hours. After averaging my results, I found that Rain Fresh had a significantly lower germ colony count than the other two brands. I hope to work more in this field in the future.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH036

Grade: 7

Title: Bread Dough and Yeast

Abstract: The purpose of this investigation was to determine which brand of active dry yeast would raise bread dough higher. Three loaves of bread were made using Fleischmann's dry yeast, and three loaves were made with Red Star yeast. Heights of dough were measured and recorded at 30 minute intervals. The data showed no significant difference between the two.

Project Number: MMH037

Grade: 8

Title: How Dirty Are Your Hands?

Abstract: Please visit exhibit for student's abstract.

Project Number: MMH038

Grade: 8

Title: What's for Dinner? More than you think!

Abstract: The intention of my science fair project was to make people aware of the harm they could be doing to their bodies by consuming bacteria, found in various meats. I will tested chicken, hamburger, cod, and pork chop when they are raw and left in the refrigerator for three days, cooked to a suitable and accurate warmth (control), thoroughly cooked and then left in the refrigerator for three days, and properly cooked and left on the counter surface at room temperature for three hours. The least total amount of colonies grown was for hamburger and pork chop. Cod contained the most amounts of colonies overall.

Project Number: MMH039

Grade: 8

Title: Can Antioxidants Reduce UV Radiation Damage in Yeast Cells?

Abstract: The purpose of this study was to determine if antioxidants can reduce UV radiation damage in yeast. Yeast cells were grown in cultures containing vitamin E, a powerful antioxidant. These cells were then exposed to ultraviolet radiation and the level of CO₂ production was measured and compared with irradiated cells that were not cultured with vitamin E. This research will help determine if vitamin treatments can be used to protect humans from ultraviolet radiation.

Project Number: MMH040

Grade: 7

Title: Are Sports Drinks Harmful To Your Teeth?

Abstract: Do sports drinks cause more tooth decay than cola and non-cola beverages? Does rinsing after drinking all of these beverages reduce the amount of decay? The beverages tested were: Red Bull, Minute Maid Lemonade, Coca-Cola, Lipton Iced Tea, PowerAde, PowerAde Option, Gatorade, and Propel. The change of pH of the beverages, mass, and x-ray length and width of each tooth were analyzed. It was found that the acid used to flavor the beverages does have an effect on the amount of demineralization which occurs in each tooth.

Project Number: MMH041

Grade: 8

Title: Hydration

Abstract: Knowing which sports drink helps avoid dehydration best is unknown to many adolescents. Dialysis tubing was used to create "cells" filled with three different sports drinks and then those "cells" were placed into Lactated Ringer's Solution for 4 hours. Magnetic stirrers continuously kept the solution and "cells" active within the beakers. Multiple trials were conducted for each drink and data collected included color, volume, and mass of fluids inside and outside the "cells" before and after the four hours. The data collected showed a difference between the various sports drinks.

INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

Project Number: MMH042

Grade: 7

Title: Bacteria on Fruit

Abstract: This experiment tested for the number of bacteria colonies on fruit before and after washing. 60 trials were done on 30 oranges, testing bacteria colonies before and after washing with water, Dial antibacterial soap, and FIT fruit wash. This experiment has not yet reached a conclusion so; I regretfully cannot include data, and a conclusion.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH001

Grade: 8

Title: The Influence of Linings in a Soundbox

Abstract: The purpose of this research was to determine the effects of different linings on the interior walls of a soundbox with regard to the properties of transmitted soundwaves. Trials were performed using a sound box and wave forms were captured using a microphone connected to a computer (running DataStudio- a wave analysis program). Each set of trials dealt with a different type of lining: no lining (control case), foam, aluminum foil, paper, Styrofoam, cotton, and saran-wrap/plastic. In each test, a tuning fork was struck with a rubber mallet to create a sound wave of a particular frequency (256 or 512 Hz). The "tip-top" of the tuning fork was placed within a hole in the sound box and allowed to transmit to the microphone. The design of the sound box was such that the microphone could only receive a wave that was forced to interact with the lining material (verified in confounding factor tests). Following the trials, the data was collected using DataStudio, analyzed in the same program, and organized in Excel. It was found that amplitude was affected by different lining materials, and the frequencies remained relatively constant to the standard starting wave. There was a difference between flexible and rigid insulating materials, where the more flexible materials resulted in lower amplitudes for the transmitting waves. There was also a tendency for lower average amplitude and a more variable frequency when overtones and irregular wave patterns were evident. Thus, it can be shown that insulating materials in a sound box have a present effect on transmitted sound waves.

Project Number: MPH002

Grade: 7

Title: Does Elev. Aff the Bounce of a Golf Ball?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH003

Grade: 7

Title: Hit it like it's hard

Abstract: The purpose was to prove the correlation between the density of a piece of wood and the difficulty in hammering a nail through it. To insure a consistent result, a device was built to hold the hammer and a piece of wood. The experiment used several types of wood with different densities: Pine, Poplar, Cherry, and Oak. The results revealed that generally, wood with higher density needed more hammer hits to get a nail through. For example, the Oak piece of wood required the highest number of hits and also, after doing calculations, had the highest density

Project Number: MPH004

Grade: 7

Title: Does Aerodynamic assistance have an effect on cars?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH005

Grade: 7

Title: Rockets

Abstract: I believe that the larger the rocket engine, the faster and further a rocket would fly. After testing several different rocket engines, my hypothesis was correct.

Project Number: MPH006

Grade: 8

Title: What's The Best Sound Insulator?

Abstract: Sound is a big part of my life because I am a musician. I intended to find the material that best insulates for my loud music. To carry out this experiment, a frame was constructed to fit around a keyboard amp. Wool heat insulation, rug material, newspapers, and styrofoam were each put around the frame at a 5 centimeter thickness. When a note was played on the keyboard, the amount of sound given off was recorded and repeated two more times for each material. Wool heat insulation was the best insulator and would be good for sound insulation use.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH007

Grade: 8

Title: Effect of Wavelength on Solar Panel

Abstract: The purpose of my experiment was to determine if different wavelengths of light effect the efficiency of solar panels. The project involved putting various colors of cellophane over a desk lamp. After placing a solar panel beneath the lamp, the electrical output was measured in volts immediately and after five minutes. This was repeated five times with each color. The results showed that blue, green, and violet, had the lowest electrical output. The colors that produced the most volts were red, orange, and yellow. In conclusion, the three longest wavelengths produced more electricity than the three shortest.

Project Number: MPH008

Grade: 8

Title: Effect of stress on green vs traditional building materials

Abstract: This project will help consumers and manufacturers understand the differences in durability between traditional and green products. To do this project the experimenter placed green and traditional materials under identical stress scenarios: weight test, tightened vise test, sandpaper test, and a spill-proof test. The data collected shows that the majority of test results demonstrate that the green building materials are more durable than the traditional building materials. The only trial that refuted the experimenter's hypothesis was the carpet test.

Project Number: MPH009

Grade: 7

Title: Physics of Roller Coasters

Abstract: The procedure of my experiment included the following. I drew a plan of the design of the track. Then I gathered materials and built a model with three sections of track. Track 1 has the first hill with a height of six inches. Track 2: eight inches and Track 3: ten inches. Using the same exact ball, I sent it down each track six times. I measured from the start of the track to where the ball stopped in inches and recorded the results on a graph. The results did support my hypothesis.

Project Number: MPH011

Grade: 8

Title: The Most Rust Resistant Metal

Abstract: The investigation I conducted was to determine which metal would be the most resistant to rust. After purchasing 4 rolls of each type of wire, the wires were then measured 11cm long. Sixteen cups were also bought, eight of them containing salt water, and eight of them containing tap water. The wires were then wrapped on four pencils, so that each pencil had four wires on it. The pencils were then placed into the salt and tap water. After conducting the experiment, the part affected by rust on each wire was then measured.

Project Number: MPH012

Grade: 8

Title: Light Bulbs and Lumens

Abstract: The purpose of my experiment was to compare the amount of light (in lumens) given off by different types of light bulbs and compare my measurements to the advertised lumens. My hypothesis was that fluorescent bulbs would give off the most light and all bulbs would measure within 50 lumens of the advertised amount. I used a light meter and identical conditions for each measurement. I tested fluorescent, brand name incandescent, and generic incandescent bulbs. I found that fluorescent light bulbs gave off the greatest amount of light and that all the bulbs gave off less light than was advertised.

Project Number: MPH013

Grade: 8

Title: The Effect of Boat Hull Design on the Generated Drag

Abstract: My purpose for doing this experiment was to find the most efficient boat hull design. I created a sluice that has one basin with holes on top and one basin on the bottom. I connected them using aluminum foil covered cardboard box lid that has two corks to hold the boat hulls made of balsa wood. I poured water in the top basin, it flowed past each hull. I recorded the ripples on a graph drawn on the aluminum foil. The results showed the teardrop shape created the least amount of drag and the squared hull had the most.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH014

Grade: 8

Title: Red Hot

Abstract: This experiment, entitled “Red Hot”, investigates the question: Does the temperature of water increase to a greater degree when exposed to infrared light versus incandescent light? This experiment was conducted because the investigator was curious about the light spectrum and how different types of light emit their energy in different ways. An experiment was conducted using an Infrared light and an Incandescent light- each emitting 250 watts. An experimental setup with no light was added as a control. The controlled variables were: amount of water, intensity of light, starting temperature, and time. The independent variable was the water temperature throughout the experiment. After carefully recording results, it was concluded that Infrared light did increase the temperature of the water more rapidly due to the longer wavelength of the rays. The waves excited the molecules and heat was created.

Project Number: MPH015

Grade: 8

Title: Cost-Efficiency of Batteries

Abstract: I used four kinds of batteries in my experiment. I also used a timer and Push Lites. First, I ran the batteries in the lights until they died. I recorded the time they lasted. I used this to determine the efficiency. I found afterward that the rechargeable batteries (Nickel Metal-hydride and Lithium Ion) were much more cost effective than the disposable batteries(alkaline and zinc-carbon). However this is only if the user is willing to pay.

Project Number: MPH016

Grade: 8

Title: Point Blank

Abstract: My question was how does the velocity of a paintball change the accuracy? My purpose for doing this experiment was that I love to play the sport of paintball and the thought of doing an experiment with one of my favorite sports was exciting. In my experiment I tested accuracy of a paintball at different speed and distances. The distances were set at 9.144m, 18.244m, and 27.432m. My three speeds were 280fps, 300fps, 320fps. I placed a circular target at each set distance and conducted my experiment with each speed. During my experiment I noticed that the lowest speed did the worst and the fastest speed did the best. My hypothesis was incorrect, the faster speed did better because the air has less time to slow it down so the paintball cuts right through the air. The slower paintball gets slowed down more and therefore is less accurate. If I had to do this experiment again I would change the velocity to the lowest and highest possible. Also I would change the distances to 15.24m, 30.48m, and 45.72m.

Project Number: MPH017

Grade: 7

Title: Physics and a Baseball Bat

Abstract: Does corking material in a baseball bat affect the distance a ball will travel? It was hypothesized that the bat enhanced with corkboard would hit the ball the farthest. The investigator was lead to believe this because of the allegations that some professional baseball players modify their bats with cork. A batting device was built to conduct experiments. Ten trials were conducted in exactly the same manner with each of the following: the solid wooden bat, a hollowed bat, and the bat filled with various corking materials. Cork was the least effective material in increasing the distance the ball traveled; therefore, the hypothesis was shown to be incorrect. The results showed rubber balls to be the most effective materials for modifying a bat to increase distance of the ball, possibly due to the elastic properties of the rubber balls.

Project Number: MPH018

Grade: 8

Title: Solar cell positions for max output

Abstract: The title of my project is Solar Panel Positions for Maximum Output. Solar energy is a non-polluting, renewable energy source harnessed by solar cells. This work intended to compare the power output of a solar panel at different angles of orientation. Voltage and current measurements were taken, for eighteen angles between 0 and 90 , in two latitudes, and with different types of cloud cover. A sun oriented panel produced between 30 – 400% more power than a horizontal panel, which shows how important it can

INTERMEDIATE DIVISION – PHYSICS

be to have solar panels oriented towards the sun. Future work could compare power output at different times of day.

Project Number: MPH019

Grade: 7

Title: Hitting Balls

Abstract: My project was on testing to see how far a baseball, tennis ball, softball, and golf ball would go off of a tee. First I set one of the four balls on the tee. Then, I had one of the four subjects hit the ball. I repeated this process for all of the balls. My data showed that the golf ball went the farthest.

Project Number: MPH020

Grade: 8

Title: Type of Ball Vs. Distance Traveled

Abstract: The purpose of this investigation is to determine whether a slow pitch softball, a fast pitch softball, or a baseball will travel further. Three different types of balls were shot out of a pitching machine. Their distances were measured. The slow pitch softball traveled the furthest at 26m, the baseball came in second at 23.7m, and the fast pitch softball traveled the least at 22.8m. The hypothesis, if a slow pitch softball, a fast pitch softball, and a baseball are thrown out of a pitching machine, then the baseball will travel the furthest distance, was not supported by the data.

Project Number: MPH021

Grade: 7

Title: Density

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH022

Grade: 7

Title: The Longest Yard

Abstract: My topic is paper airplanes and my question is: "What type of paper airplane flies the farthest?" I decided to test on the basis of materials used to build the airplanes. So I built three airplanes of the same design, only varying the materials I used to build them. I built one out of computer paper, one out of heavier poster paper, and one out of aluminum foil. I hypothesized that the aluminum foil airplane would fly the farthest because it was the lightest. My results showed, by the mean average of the three trials of each plane, that the computer paper plane was first with an average of 4.08m, followed by the aluminum foil plane with 3.69m, and finally the poster paper with 3.39m. My hypothesis was wrong because, although lighter does fly better, if a plane is too light, it will not fly well either.

Project Number: MPH023

Grade: 8

Title: Do Good Heat Insulators Also Make Good Sound Insulators?

Abstract: My experiment is testing to find if good heat insulators would also make good sound insulators. These are the steps I followed to conduct this part of the experiment. I used a box with an open end, and put a buzzer inside. Then, I tested it with vinyl, tile, wood, glass, plexiglas, and particle board covering the open side. For heat, I used a griddle, and turned the temperature to 93.3 degrees C. I put every material on it for two minutes, and took the temperature. After both experiments I compared the results and the final result was inconclusive.

Project Number: MPH024

Grade: 8

Title: EMF Reduction

Abstract: Two years ago I measured the EMF being generated by household appliances. Last year, I found that the EMF of a mixer could be reduced 85% by adding coils and generating opposing EMF. This year I investigate if adding coils to a larger appliance (can opener) will yield similar results. The opener current draw is twice that of the mixer and the motor utilizes a cage rotor versus a wound rotor. I found that the coils themselves would reduce the EMF only 25%; however, if I added a ferrous shell about the motor, I could obtain better than 75% reduction.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH025

Grade: 7\

Title: The Effects of Distance on Accuracy

Abstract: The purpose of this study was to determine if accuracy while shooting an Air-Soft pellet gun would be effected by the distance the subject stood from the target. The procedure followed was to set up a target. Then mark off distances 2, 4, 6, and 8 meters from the target. The gun was loaded with 10 BB's and all shot at two meters. A new target was then replaced. The same procedure was followed for all distances. Accuracy was the best at the 4 meter distance.

Project Number: MPH026

Grade: 8

Title: The effect of Temp. o Maglov Trains

Abstract: The purpose of my experiment is to show that Maglev trains are stronger in colder temperatures. I constructed a rig made of wood with a magnet in it, I pushed another magnet into a straw, put it next to the rig so they would repel, and put a block of Styrofoam next to it so it would be pushed away. I recorded the distance the block was pushed. I put the rig in the freezer to make it colder, and recorded again. I did the same thing in the oven. The test showed that the cold makes the train stronger.

Project Number: MPH027

Grade: 8

Title: Is There Truly a Sweet Spot?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH028

Grade: 8

Title: Building An Electric Generator

Abstract: Faraday's law of electromagnetic induction states that a voltage will be generated in a coil of wire with a changing magnetic flux through it. This voltage is proportional to the number of coils, the area of the coil, the magnetic strength, and the speed of rotation of the magnets. I did experiments to test this law. Procedure: I built a small electric generator. I wrapped the electric wire around a cardboard box and rotated the magnets inside the coil with an electric drill. I did 3 experiments by varying 1) the number of coils, 2) the strength of magnets, and 3) the rotation speed of the magnets inside the coils. In each case I measured the voltage produced across the coil by a voltmeter. I plotted my data with Microsoft Excel and found out whether my data could verify Faraday's law. Finally I did 2 calculations base on my data. Data: My data showed that the voltage produced across the coil of wire was proportional 1) the number of coils, 2) the number of magnets (strength), and 3) rotation speed of the magnets. I did calculations based on my data and found out the generator efficiency and designed one which could produce household voltage. Conclusion: My generator efficiency was 63% and my data verified Faraday's law.

Project Number: MPH029

Grade: 8

Title: Clammy Air - What It Does To Your Hair

Abstract: The purpose of this project was to test the humidity levels in the air using human hair. Anyone obsessed with hair and weather forecasters would be interested in my project.

Project Number: MPH030

Grade: 8

Title: Specific Training for Baseball Pitching Velocity

Abstract: The purpose of this project was to determine if there is a significant increase in pitching velocity due to strength and agility training. My finding concluded that both strength and agility training increase overall velocity of a baseball pitch.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH031

Grade: 7

Title: Sound Absorption

Abstract: What material will absorb the most sound? It is hypothesized that soft, porous materials will absorb the most sound. A brief procedure of the experiment is as follows; Construct a “pocket” in the sound chamber to place the testing material between the sound producing alarm and the decibel meter. Each material will be tested 5 times. An average will be used.

Project Number: MPH032

Grade: 7

Title: Drinks vs. Foods

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH033

Grade: 8

Title: Let there be light or dark

Abstract: The purpose of my experiment was to see whether you blinked more in light or in dark. The procedures with this experiment include bringing someone into a light place to where you would count their blinks, then you would repeat it again to see another result. Then bring them into a dark room and do the same thing. My data was that in the light the number of blinks the people had, has been averaged, 18-24. For my data in the dark, the number of blinks the people had, has been averaged, 11-13.5. As I stated in my hypothesis, I think you blink more in the light because the light is entering your eye, causing you to blink more. With my experiment it showed that you do blink more in light. With the data I have, it shows the average between the two trials I have done. The average that I have shows me that we do blink more in light, which means we blink more in the day than we would at night.

Project Number: MPH034

Grade: 7

Title: Which Battery Last Longest?

Abstract: My Science project proves that some of the commercials you see on television may be wrong. In my project, I prove that some batteries last longer than others. I tested Duracell, Rayovac, Energizer, and Propower batteries. I thought that Duracell was going to last the longest because of its materials, but in the end, I found out that Propower lasted the longest, followed by Rayovac, Duracell, and Energizer lasting the least amount of time. Propower also cost the least followed by Rayovac, Energizer, and Duracell costing the most. It proved my hypothesis is wrong. My project proved them wrong.

Project Number: MPH036

Grade: 7

Title: Tennis Balls and Temperature

Abstract: This experiment tested five brands of tennis balls to see if they bounce as high when the temperature decreases as they do when it is warmer. Fifteen balls of each brand were dropped from a wrist on top of a metric ruler. Rebound was captured by video camera, then measured and recorded. This was done at three temperatures. The experiment proved my hypothesis, that the tennis balls did not bounce as high at lower temperatures. The lowest temperature did not yield a higher rebound in any brand of balls. On average, the lowest bounce and highest range was always Sky Bounce.

Project Number: MPH037

Grade: 7

Title: Egg Physics

Abstract: Eggs are composed of 3 main parts; shell, yolk and white. In this project I intended to find out if the shape of the egg has an effect on which way it would hold the greatest amount of weight. In my procedure I simply set the eggs holding apparatus down on a flat surface, set the egg on top in position, and then set the tube down around the apparatus. Finally I set the products on top of the egg until it broke. This experiment showed that when the egg was vertical, pointy end up, it held the greatest weight.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH038

Grade: 8

Title: Eff. of Temp. on a Soccer Ball's Bounce

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH039

Grade: 8

Title: Does Temp. Affect Note Quality?

Abstract: The purpose of this experiment was to find if the temperature of an instrument will affect the note quality. The hypothesis was that if an instrument is heated or chilled, the note quality will be sharper than that of an instrument played at room temperature. Three different instruments were played at the assigned temperatures, and the note quality was determined using a mechanical tuner. Overall, the hypothesis was proven correct because when heated and chilled, each instrument became sharper than their original tone played at room temperature.

Project Number: MPH040

Grade: 7

Title: Viscosity Of Oil

Abstract: With such a wide variety of motor oils available to consumers, the purpose of this experiment was to test the viscosity of oils at different ratings. I set the torque at 108 Nm and then put a drop of oil on the roller bearing, and turned the machine on. I repeated this process for the oils and at a torque of 136 Nm. I found out that at an increased torque, the time it takes for the roller bearing to stop spinning decreased as stated in my hypothesis, so my conclusion was proven correct.

Project Number: MPH041

Grade: 7

Title: Fire and Burning - What factors affect burning?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH042

Grade: 8

Title: Free Falling

Abstract: This project investigates parachutes. The experimenter was curious about different fabrics that are used for parachutes. She chose three different fabrics: nylon, polyester, and cotton. She constructed a sample parachute from each fabric type. A toy soldier was attached to the parachute and dropped three times from 3 different heights (2m, 3m, and 4m.) Drop times were recorded for each trial for all fabrics.

Project Number: MPH043

Grade: 7

Title: The Radio

Abstract: December 23rd, I began experimenting, first I stripped a cable down to its wire. This would come into use later in my experimenting. The next portion of the experiment was to make a coil. Which with the proper antenna would allow me to receive different radio frequencies. The antenna that I have built, has not picked up any frequencies. I would have to build a farther extended antenna and find the proper ear bud to hear the radio through. The results do support the hypothesis.

Project Number: MPH044

Grade: 7

Title: Paper Air Force

Abstract: This science fair project is about paper planes. To be more exact, I tested to see what material would make the best(not necessarily paper)airplane. I did this test by making a Nakamura lock-style airplane out of aluminum, office paper, and construction paper, flying each one three times. I was pretty sure the best flyer would be aluminum foil, seeing as one could easily form it to get the anhdral and dihedral just right. This hypothesis was proven incorrect, aluminum being beaten by far by the construction paper plane. I would do this project again if I had more materials to make planes with.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH045

Grade: 7

Title: It's the Bounce That Counts

Abstract: My question was "Why do objects bounce?" My hypothesis to this question was "I think heavier objects bounce higher than lighter objects." To find out the correct answer to this question I first gathered all of my materials: measuring tape, pencil & paper, a pink eraser, an empty soda can, a baseball, a quarter, a small bouncy ball, a basketball, a shoe, a golfball, a feather, a steel ball bearing, and a piece of playdough. These were the surfaces I bounced the materials on: a cement floor, a carpeted floor, a soft pillow, a wood floor, and a heavy steel plate. My procedure was first, unwind the tape measure and tape it to the wall of a room with one of the chosen floors. Then have an assistant drop one of the objects from the 5 foot mark. When you are measuring the height of the objects bounce measure it from the bottom of the object. Bounce each object ten times to get a more exact measure. Record the info from each bounce on a graph or chart. Repeat this process with each object and on each surface. In doing the project I learned my hypothesis was proved wrong. I learned that there is Kinetic energy in an object when the object is moving. Sometimes the bouncing surface absorbs some of the kinetic energy, sometimes it doesn't absorb any. When the surface absorbs all or some of the energy the object doesn't bounce much. When it doesn't absorb any the object can bounce fairly high. The pillow absorbs a lot of the kinetic energy. On the cement floor there was hardly any energy absorbed so the object bounced.

Project Number: MPH046

Grade: 8

Title: It's Too Heavy!

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH047

Grade: 8

Title: Do The Wave

Abstract: When playing a trumpet, the temperature of the trumpet can affect its pitch. Being a trumpet player, I wondered how temperature affects sound through metals. To determine the answer to this question, different metals were tested to see if temperature changed the pitch produced by hitting the metal. Different metals were heated or cooled, then struck with a wooden mallet. The pitch produced by the metal was measured with an instrument tuner. Ten trials were tested. The data was analyzed and a difference was found between the different metals.

Project Number: MPH048

Grade: 8

Title: Which colored light shines the brightest through fog ?

Abstract: For my experiment I tested which colored light shines the brightest through fog. I experimented by imitating fog with a mixture of milk and water. I filled the container with the mixture, put colored cellophane over a flashlight projector, and shown the light into the jar. On the other side of the jar, I placed a light meter that measured illumination level of the colored lights on a scale of 1-10. After testing the colors purple, pink, yellow, green, and red. Yellow averaged out the brightest through the foggy mixture with a level of 3.87.

Project Number: MPH049

Grade: 7

Title: Acceleration Science

Abstract: Will a motorized object change in acceleration with more weight? Will it change if the track was going up a slope? Well, I tested it. The way I thought of this project was that I thought of a car, a modernized object. Does the car's acceleration differ with more people in it, and does the car's acceleration change when it goes up a slope? My hypothesis was that it will change on the slope because the car might need more power. On the straight track it will not. All I needed was a model train, books to make a slope, track, a control, and a dollar of pennies which weighed .4 pounds. I put together a model train that had a 4 ft. long straight away. I put a piece of tape at the beginning of the 4 ft. I put a piece of tape at the end of the 4 ft. I found the control. I put it on power 3. I stopped it when the front crossed the 2nd piece of tape. Then I did it once more with .8 pounds of pennies on the train. I had lots of fun doing this experiment.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH050

Grade: 7

Title: Which Material Lowers Decibels Most?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH051

Grade: 7

Title: Energy Efficient Roofs

Abstract: There are different types and colors of roofing materials available for consumers. The purpose of my experiment is to find out which type and color of roofing material will keep houses cooler in the summer and will save energy cost. My hypothesis is that the light cooler metal roofs with high reflectivity will keep houses cooler. I heated the roofing materials using a heat lamp and measured the temperature change for each material for forty minutes. Among the materials I tested, wood shingles gave the lowest temperature change, which means it is the best roofing material to keep houses cooler.

Project Number: MPH052

Grade: 8

Title: How Hot Does Your Coffee Stay

Abstract: I did this experiment to see which coffee mugs insulate better. This is relevant to real life, because many people drink coffee. I first had to heat water in the coffee maker. Then I'd measure the temperature in the container. Then I'd take readings every five minutes for fifteen minutes. I did five trials per cup. The data showed that the double-walled plastic mug with a large air gap between the walls retained heat the best with an average heat loss of 7.14 C. The worst insulator was the glass mug with an average heat loss of 21.02 C.

Project Number: MPH053

Grade: 7

Title: How wire size affects circuits

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH054

Grade: 8

Title: Board Slide or No Slide

Abstract: The purpose of this experiment was to determine the effect of lubricants on the distance of a board slide. My procedure was to cover my grind rail with different lubricants and measure the length of the slide for each different lubricant. It was determined that the homemade wax reduced friction the best. All of the slides with lubricants went further than with no lubricants. When the rail got more slippery, the board slide was further.

Project Number: MPH055

Grade: 8

Title: From Money to Electricity

Abstract: The purpose of this experiment was to determine what combination of coins would produce the strongest homemade battery. During this experiment homemade batteries were constructed of different coins from different time periods (as they were made of different materials) along with salt water and paper towels. Voltage was tested to see which combination of coins would serve as the best battery. This experiment could benefit large corporations who use batteries to help run businesses, as well as the average consumer.

Project Number: MPH056

Grade: 7

Title: Moisture: A Flute's Worst Enemy

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH057

Grade: 8

Title: Paintball Physics

Abstract: Does the temperature of a .68 caliber paintball affect its accuracy? Finding new ways to increase the accuracy of a paintball gun is an objective of any enthusiast. One unique way may be to alter the paintball. Three groups of 25 paintballs at 32 C, -14 c, and 12 C were shot, using a gun stand, at a target. After each shot, accuracy was measured in centimeters away from the bulls eye. The accuracy of the 3 groups of twenty five was then averaged. All three averages differed, which means the temperature of a .68 caliber paintball does affect its accuracy.

Project Number: MPH058

Grade: 8

Title: Colors everywhere!

Abstract: The purpose of this experiment was to test the difference in visible light spectrums between boys and girls. The visible light spectrum includes the wavelengths of light that humans can see with their eyes alone. Subjects used spectrosopes and recorded their visible color light spectrum in nm. The experiment found that girls had a slightly larger visible light spectrum than boys.

Project Number: MPH059

Grade: 8

Title: Trajectory of Illegal Baseballs

Abstract: Which illegally modified baseball will have the greatest change in trajectory? This experiment was intended to find an answer to that question. It was hypothesized that the pine tar covered baseball will have the greatest change in trajectory. Five milliliters of each illegal substance was placed on each baseball. The illegal baseballs came out of the pitching machine and the data was recorded. The results showed that the pine tar covered baseball and the water covered baseball did have the greatest change in trajectory. The hypothesis was shown to be partially correct.

Project Number: MPH060

Grade: 8

Title: Accelerating with Electricity

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH061

Grade: 8

Title: Icy Cups

Abstract: In my project, I wanted to find out which type of water would freeze the fastest. I used carbonated water, distilled water, salt water, sugar water, and tap water. I had 10 trials in which I observed the five different types of water in twenty minute intervals. I concluded that on an average, the distilled water froze the fastest.

Project Number: MPH062

Grade: 8

Title: Light By Friction

Abstract: The purpose of this experiment was to test the possibility of creating electricity through friction. Different fabrics were used including nylon, wool, cotton, and polyester. These fabrics were used to generate static electricity through friction on a wand that was then placed near a light bulb. Nylon was able to light the light bulb up the best, if only for a few seconds.

Project Number: MPH063

Grade: 8

Title: Ultra vs. Regular

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH064

Grade: 7

Title: Depth Dropped Shapes Go Into Sand

Abstract: The purpose of the project was to identify which shape will penetrate a surface, more. The hypothesis was if three different shapes were dropped into sand then the cone would go the deepest because its surface has very little air resistance and its shape allows it to have a greater effect when it breaks the surface of the sand. Materials, a dropping board was used for all shapes and depth measured. The conclusion showed the cone could penetrate a deeper depth than both the sphere and cube. The application is that this could be used for vehicular designs on tanks.

Project Number: MPH065

Grade: 8

Title: Magnus Effect

Abstract: When a pitcher throws a curve ball he has to put spin on it. The spin he puts on it is called the Magnus effect. When the ball is thrown, the air on one side speeds up and the other side slows down. This causes the ball to curve. In this experiment, the experimenter will swing a baseball and softball from a pendulum. The string will be twisted various amounts of times for each trail with each ball. This experiment will show how far a curve ball can curve. Results will be gathered by recording the path of the ball on a graphic enlargement of a protractor.

Project Number: MPH066

Grade: 8

Title: Slow & Steady Wins the Race

Abstract: This project was about physics, more specifically viscosity. In this project I tested the effect of temperature on the viscosity of honey. I predicted that the honey that was heated would move the fastest because heat gives it energy and energy makes it move faster. First, I measured 0.5 oz of honey and put it in a dish and left it on a table at room temperature, which was approximately 25.555 degrees C. Then I put 0.5oz of honey in another dish and put it in a freezer set at 4.444 degrees C. Next I palced 0.5oz of honey in a tin bowl and placed it in an oven set to 176.666 degrees C. THEN I set a timer for 20 minutes. While I was waiting for the timer to go off I took a flat baking pan and propped it up 12.7 centimeters off the table. THEN I placed a ruler next to the edge of the pan. When the timer went off I took the dishes and the bowl and put them on the table. I poured the honey on the higher end of the pan and watched it flow. I stopped after one of the different types of honey advanced 12.7.centimeters. I recorded my observations, cleaned off he baking pan, and moved on to trials 2 and 3. To my surprise, my hypothesis was incorrect. The honey at room temperature moved the fastest. In all the trials the heated honey moved very fast for a few seconds and then it hardened to something like a lollipop. The frozen honey didn't even move from the dish. When I touched it, it was kind of a gel. The point of my project was to find if temperature affected viscosity, but I think I could have gone many different ways with my project or made some improvements. I think that the heated honey definitely would have gone the fastest if it were under constant heat. I also could have tested the viscosity of other substances instead of testing temperature.

Project Number: MPH067

Grade: 7

Title: Which Insulator is the Most Effective?

Abstract: The purpose of this experiment was to see what type of insulation would keep water measuring 100 C the warmest for the longest period of time. I boiled the water and added 375 mL of water to two different bowls. I placed one bowl in a box covered in foil. I placed the other bowl in a box covered in red felt. I closed the lids and checked temperature every 10 minutes. The results were the same for all three trials with the foil box maintaining the warmest temperatures for the longest period of time.

Project Number: MPH068

Grade: 8

Title: Hockey and Heat

Abstract: The investigator is a hockey player and wants to know if pucks bounce more when heated or frozen. Knowing whether a puck bounces more when heated or frozen is a good safety precaution to know when making a rink. This project explored the difference in bounce with different temperatures.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH069

Grade: 8

Title: Insulation of Fabrics

Abstract: The purpose of this experiment is to determine which fabric insulates heat best. Eight fabrics were tested: wool, cotton, gabardine, corduroy, gauze, velvet, satin, and polyester. The procedures were as follows: fabrics were cut into two pieces. A pan was filled with tap water and was heated until it was 100 degrees Celsius. The beaker was wrapped with the appropriate fabric. The water was poured into the beaker and the thermometer was attached. The temperature was recorded every five minutes for 20 minutes. Repeat three times for each fabric. Wool provided the best insulation and satin the worst, as hypothesized.

Project Number: MPH070

Grade: 7

Title: Which Battery Brand Lasts Longest?

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH071

Grade: 8

Title: How Warm are Your Clothes?

Abstract: The title of my investigation is, "How Warm are Your Clothes?". The purpose was to see what kind of fabric holds the most heat. Fabric samples were put under a heat lamp until desired temperature. The 100% Cotton Terry Cloth held the most heat because of its air pockets, and the Polyester Knit and Leather held the least. If you're looking for warmth, choose cotton, polyester, or a blend. Stay away from leather.

Project Number: MPH072

Grade: 8

Title: Corrosion of Aluminum Alloys

Abstract: Last year, I tested the strength of aluminum alloys. The purpose of this investigation is to determine if the alloy that proved strongest would corrode the least. I created a container that would spray salt water over the 5 samples of each alloy, 5083, 6022, 6061. Every 5 samples were cleaned, massed and recorded. 5083 proved strongest but showed most corrosion. 6022 proved weakest but showed least corrosion. 6061 was medium strength and medium corrosion. Aluminum has a natural self-renewing barrier to corrosion. This film is why the results were not expected. 5083 contains the least aluminum, therefore it has less protection and corroded more.

Project Number: MPH073

Grade: 8

Title: Effect of Glue on Bridge Strength

Abstract: The purpose of my project was to find how adhesives affect the efficiency of wooden bridges. I tested the strength of bridges based on the glues used to bond their joints. I measured my results in bridge efficiency. Bridge efficiency is how much weight a bridge can hold compared to its own weight. I hypothesized that the polyurethane resin would have the greatest efficiency. The bridge using a polyurethane resin was the weakest with an efficiency of 455. Two bridges shared the best results. The aliphatic resin and the epoxy cement both had an efficiency of 910.

Project Number: MPH074

Grade: 8

Title: Mag Shield

Abstract: Magnets are powerful forces. It is important to know what materials best shield against the powerful force. I placed the shielding materials between a compass and a magnet. I then moved the magnet and took the displaced degree as the shielding property. Most materials had no effect except for steel and iron, which moved 5 or less. Only metals with magnetic properties shield against magnetic forces.

INTERMEDIATE DIVISION – PHYSICS

Project Number: MPH075

Grade: 7

Title: Effect of Temp. On Electrochem. Cell

Abstract: Please visit exhibit for student's abstract.

Project Number: MPH076

Grade: 8

Title: Sun Oven

Abstract: This experiment was designed to test if the sun could produce enough energy to cook a marshmallow. The experimenter would use a self-constructed solar cooker, a GE® microwave, and a GE® oven. The cookers (solar cooker, microwave, and oven) would cook the marshmallow to the same amount of doneness. Then the experimenter would compare the speed taken for the marshmallow to reach this key stage and the experimenter would calculate the cost difference to the cookers according to their efficiency. The results should show the microwave to be the most efficient in speed followed by oven, then the solar cooker. According to cost, the solar cooker came in first because it used the sun as the power source and the sun is a free resource. The microwave came in next, and the oven came last because of the cost of electricity being used for a large object at a slower rate.

Project Number: MPH077

Grade: 8

Title: B3 Beachball Bounce

Abstract: No backyard swimming pool is complete without a bunch of pool toys, especially beach balls. This experiment was designed to test the height of the bounce of a beach ball when filled with substances other than air. Three different substances were put in a beach ball. Then the ball was dropped from a stepladder and the height of the bounce was recorded. It was determined that filling the ball with substances other than air had an effect on the ball's bounce.

Project Number: MPH078

Grade: 7

Title: How surface affects velocity

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – TEAM

Project Number: MTM001

Grade: 8

Title: "Beets Me"

Abstract: The purpose of our project was to find out what type of fabric held color the best after washing. We soaked two peices each of fleece, cotton, silk, and wool in beet dye for one hour. After letting them dry we washed and dried one of each. Then we compared the dyed/washed fabrics to the dyed fabrics. It appeared that the wool retained the most dye, then silk, then cotton. The dyd appeared to have washed out of the fleece completely. Our conclusion was that natural fibers (wool, silk and cotton) hold dye better than synthetic fibers (fleece).

Project Number: MTM002

Grade: 7

Title: Acid Rain Effects

Abstract: We wanted to see what acid rain would do to certain areas and what it affects the most. We did a lot of research and worked in a lab with a chemist. We made a solution of acid rain. We poured a galloon of acid rain on each subject. We found the items were affected.

Project Number: MTM003

Grade: 8

Title: Basketball Return System

Abstract: We did this project so we can practice shots without getting tired. We went toa shop and welded metal rings together. We then welded pieces of metal around the rings so the ball would not get stuck and not release the ball back to you. Our project was successful in returning the ball back to us.

Project Number: MTM004

Grade: 8

Title: Cotton: The Shrinking Dilemma

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM005

Grade: 7

Title: Does Caffine Increase the Rate of Your (Blood Pressure)?

Abstract: The purpose of our project was to determine if caffiene increases the rate of humans blood pressure,also to determine if to much caffiene causes diseases and infections. The procedures of our project are first gather our materials. then we will gather our participants which vary from different age groups.We will maesure all the participants blood pressure befor drinking the caffinated drinks.then the participants will then be able to drink the caffinated drinks. Then we will measure the participants blood pressure right after they drink, and agian at five minutes and at ten also. Next we will then be able to compare the participants results that was measured on the blood pressure machine,

Project Number: MTM006

Grade: 7

Title: Drop 'n' Pop

Abstract: Experiments were performed to determine which type of soda would release the highest and most volume of liquid when Mentos were added to it. Five different types of soda were used and the height of the soda ejected and the volume of soda ejected were measured. The results were charted and the "winner" was determined. The types of soda reacted differently and the 2 types that showed higher ejection of liquid were the "Diet" sodas. There was no correlation between the height and total volume ejected and actually the soda with the lowest height released the most volume of liquid.

Project Number: MTM008

Grade: 7

Title: Good or Bad can we make them Mad?

Abstract: Please visit exhibit for student's abstract.

INTERMEDIATE DIVISION – TEAM

Project Number: MTM009

Grade: 7

Title: Gum

Abstract: Our science fair project was about trying to find which brand of gum lasted the longest. Our hypothesis was that the brand Stride gum would last the longest since they advertised it that it would last longer than any other gum. Our supplies were 10 pieces of Stride, Hubba Bubba, Bubblicious, Extra, Big Red, Juicy Fruit a stopwatch and a calculator. Our experiment consisted of chewing five different types of gum. These were Stride, Hubba Bubba, Bubblicious, Extra, Big Red, and Juicy Fruit. We divided who would chew each gum. Sarah chewed Hubba Bubba and Juicy Fruit. Evan chewed Big Red and Bubblicious. Kelsey chewed Stride and Extra. We chewed ten pieces of these gums until we thought that the flavor was gone. We then noted the time with the stopwatch and wrote these times on a piece of paper. After we had finished chewing all of the gum and collected the times, we took each of the gums' times and used the mathematical concept of mean to average out the time it would take to extract the gums' flavor. Our data showed that Stride lasted the longest among all of the gums and Bubblicious lasted the least among the gums. Our conclusion was that our hypothesis was correct that the brand Stride gum lasted the longest. It turned out that Stride lasted the longest and Bubblicious lasted the least.

Project Number: MTM010

Grade: 7

Title: Hamster Polooza

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM011

Grade: 8

Title: High Energy Bill Due to House Color

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM012

Grade: 7

Title: How does wind speed and shape affect drag?

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM013

Grade: 8

Title: Is Your OJ Okay?

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM014

Grade: 7

Title: Mouthwash: Effective or Defective

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM015

Grade: 7

Title: Rewards vs. Punishments

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM016

Grade: 8

Title: Sleep Deprivation

Abstract: The project we did was Sleep Deprivation. We did this so we could find out how kids at the age of 13-15 tests when they are tired compared to when they are awake, and fresh. We did this so we could find out why some high school kids are not doing as well in school. We did a sequence of test every 4 hours to

INTERMEDIATE DIVISION – TEAM

see how much there progress decreased. We found that every time we tested them they got worse and worse. We found that kids our age are not getting enough sleep and that is why there test scores are decreasing.

Project Number: MTM017

Grade: 7

Title: The Effect of Music on Heart Rate

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM018

Grade: 7

Title: What our "piggies" like to eat.

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM019

Grade: 7

Title: Which One?

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM019

Grade: 7

Title: Which One?

Abstract: Please visit exhibit for student's abstract.

Project Number: MTM020

Grade: 8

Title: What's an Angle Got To Do With It?

Abstract: The experiment was conducted to figure out what angle would make a solar panel work more efficiently. The procedure that was used was: construct a solar panel array, make a holding tank for the water, position a light to match the angle of the sun, position the panel to the desired angle and conduct the experiments. The conclusion was that the 30 degree angle worked the best. The orders of the angles from the most efficient to the least efficient were as follows 30, 45, 60, 85 and 5 degrees.