



72nd PITTSBURGH REGIONAL SCIENCE & ENGINEERING FAIR

INTERMEDIATE DIVISION STUDENT PROJECT ABSTRACTS

April 1, 2011

TABLE OF CONTENTS

| | PAGE |
|--|-------------|
| INTERMEDIATE DIVISION | |
| BEHAVIORAL AND SOCIAL SCIENCE | 1 |
| BIOLOGY..... | 14 |
| CHEMISTRY..... | 26 |
| COMPUTER SCIENCE / MATH | 47 |
| CONSUMER SCIENCE..... | 49 |
| EARTH/SPACE / ENVIRONMENT | 61 |
| ENGINEERING / ROBOTICS..... | 74 |
| MEDICINE / HEALTH / MICROBIOLOGY | 80 |
| PHYSICS | 89 |
| TEAM..... | 104 |

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.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS001

Grade: 7

Title: What Packaging is Most Appealing to Small Children?

Abstract: A group of 6-year old students were presented a variety of boxes, each covered in a different color. Student responses regarding their favorite were then tabulated. Additional studies of packaging regarding animated characters and bows were also collected. Results were evaluated as a whole and based on gender.

Project Number: MBS002

Grade: 8

Title: The Effect of Music on Test Taking

Abstract: My science fair experiment was "The Effect of Music on Test Taking". During my research I found that classical music should be the most effective, but in my experiment it was rock. The purpose of my experiment was to figure out which music was the most effective during a test. During my experiment I took different classes from the sixth and seventh **Grade** and tested the students in the class with each music and my control. My final end results for each musical selection listed worst to best as follows: Classical 62.9%, Control 63.9%, Jazz 64.2%, Country 69.5%, and Rock 74.3%.

Project Number: MBS003

Grade: 7

Title: Exploring Concentration & Performance

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

Project Number: MBS004

Grade: 8

Title: The Stroop Effect Memory vx. Color Perception

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

Project Number: MBS005

Grade: 8

Title: Keeping Up With The Beat

Abstract: I am trying to find out if playing music while running affects your speed. I chose to do this project because I wanted to know if there was a reason for some people using a MP3 player while they run. To do this project, I measured out 50 meters and marked the start and finish line. I had the participants run once without music while I timed them. On a different day, I did the same thing, only this time, they ran with music playing.

Project Number: MBS006

Grade: 7

Title: Reading with Music

Abstract: What I did was have 5 people read a page and a half story called "Teaxting Trolls". While they read, I had music playing in the background. First I had them read to slow music. After that, they read the same story with fast music. I timed them both times. The first song

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

was slow, which was sung by Susan Boyle. The fast music was called Sojar Boy. I had 2 boys and 3 girls. The results were that everyone went faster with fast music and slower with slow music.

Project Number: MBS007

Grade: 8

Title: The Color of Money

Abstract: Does ink color have any effect on memory? I performed an experiment to test this. I made five lists with fifteen words in each. One list was black, and the others were blue, pink, yellow, and red. Ten people had to study each list for thirty seconds, and write down what they remember. My results proved my hypothesis was correct: traditional black did the best. Moreover, the ink color may have an effect on memory, but further testing is necessary.

Project Number: MBS008

Grade: 7

Title: I Thought I Saw It

Abstract: To test the hypothesis that age effects memory capability, 120 participants were gathered from 4 different age groups. The age groups were **Grades** 5th-6th, **Grades** 7th-8th, **Grades** 9th-10th, and a "post" group composed of 40-60 year olds. To test the participants, a homemade video was created with 5 scenes. Based on the video, a questionnaire was written with 6 questions per scene, 30 questions total. Three of the questions pertained to main focus, whereas the other three pertained to sub focus. The results were then graphed and analyzed.

Project Number: MBS009

Grade: 8

Title: Do Certain Foods Effect Word Search Puzzle Performance?

Abstract: Eighth **Grade** students were provided a small snack, and after a set time period, were then given 2 minutes to complete a simple word search puzzle. Snacks evaluated included either 1) crackers, 2) cheese or 3) sugar (candy). Results were evaluated as a whole and based on gender.

Project Number: MBS010

Grade: 8

Title: Making Scents Out of Aromatherapy

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

Project Number: MBS011

Grade: 7

Title: It's Music to my Ears

Abstract: To see if music has an effect on memory, a test was designed in which participants had to study lists of words and write down how many words they remembered. Four age groups, which were Grades 5-6, Grades 7-8, Grades 9-10, and Ages 40-60, were tested. The participants studied the first list without any music playing, the second with classical, and the third with rock and roll. After 120 people were tested, the final results showed the classical

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

music helps more than no music and rock and roll. Rock and roll helped more than no music, which helped the least.

Project Number: MBS012

Grade: 7

Title: Horsensory Perception

Abstract: Understanding the movement of a horse's ears in response to different sounds is important in understanding how to control your horse. This experiment was conducted to determine if horses would have more of a reaction to unfamiliar sounds than familiar sounds. The unfamiliar sounds of a doorbell, garbage disposal, car horn, and the familiar sounds of dog barking, bag of carrots breaking, twigs snapping, and horse whinny were recorded at the same decibel level. The sounds were played for 5 horses in their stalls on two different occasions for the same amount of time and same time intervals between each sound. The sound source was also the same distance from the horse each time. A decibel meter was used to ensure the same intensity for each sound, and reactions were recorded in a chart. My research showed my hypothesis to be incorrect: the horses tested did not react more to unfamiliar sounds. Rather, they reacted more to sounds they recognized relating to food, exercise, and animals.

Project Number: MBS013

Grade: 8

Title: The Effect of Fear on Your Heart Rate

Abstract: The purpose of my experiment was to study how the body reacts to fear. I had my subjects fill out a quick survey. Then I would take their pulse before, scare them, then take their pulse after. I recorded both pulses in a table to see the change in the heart rate. The results of my experiment were that a majority of my subject's heart rate went up. In conclusion my experiment was very successful I proved my point and my hypothesis to be correct. In the future I would like to change some aspects of my experiment.

Project Number: MBS014

Grade: 8

Title: Color and Change Detection

Abstract: How does the addition of color affect the ability to detect change? It was hypothesized that the use of color will improve visual detection, and additions to visual scenes will be easier to detect than deletions. 36 subjects were divided into two groups. Group 1 viewed a timed PowerPoint presentation in black and white containing changes to visual scenes. Group 2 viewed the same presentation in color. The colored slides were exactly the same as the black and white group, and all were carefully colored by the experimenter with the same colors in the same intensity and hue using the program "Paint". (Each picture took 45 minutes to color.) Also, the subjects were the same age, had 20/20 vision, and were tested at the same time of day and in exactly the same manner. This was done to ensure that all aspects of the project would be controlled. The results showed that the use of color improved change detection, and additions were easier to detect than deletions, which supports the hypothesis.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS015

Grade: 8

Title: Cell Phones and Concentration

Abstract: Cell phone distraction while driving is dangerous and causes many injuries and fatal accidents. Multitasking with cell phones while driving takes away time and accuracy from each task and reduces concentration. This experiment tested if talking and texting affected concentration on a small motor task. It was hypothesized that texting would have the largest effect on concentration. The subject was given 4 minutes to build a 100 piece puzzle without distraction. The test was repeated with talking and texting distractions. The average number of pieces assembled was highest when there were no distractions. Texting affected concentration the most. This research could benefit law makers and the auto industry in establishing safe driving practices.

Project Number: MBS017

Grade: 8

Title: Music & Heart Rate

Abstract: The purpose of this experiment was to determine whether or not music had an effect on a person's heart rate. A test was set up with a person walking nine meters, four different times. The last three times, the person listened to music while walking; a different song for each time with different beats per minute was used. After each time, the person's heart rate was checked to see if the rate had changed with music. To conclude, the data showed that the music used in this experiment did not have an effect on the heart rate of a person.

Project Number: MBS018

Grade: 8

Title: Playing with Emotions

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

Project Number: MBS019

Grade: 8

Title: How Do Color and Music Effect A Person's Emotions?

Abstract: Emotions change depending on one's current situation. This researcher wanted to know how color and music affected someone's emotional state. For this project, subjects took an online "Mood Tracker" test to determine their current emotion, and then subjects were exposed to a color, music, or combination of both. After exposure, the subjects took the "Mood Tracker" test again to find any change in emotional state. During the test, the subjects reported emotional changes before and after exposure to color or music. Analysis of the data showed a difference in emotions reported in the "before" and "after" test.

Project Number: MBS020

Grade: 7

Title: Stop look at that

Abstract: The purpose of my experiment was to test the theories that women will pick up more coins than men and that higher valued coins will be picked up faster. The procedure that for this experiment was: Put down a coin, and check the time. Wait until someone passes or

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

picks up the coin and write down the time it took for the coin to be picked up and the gender of the person that passed or picked up the coin. In conclusion, men and women both picked up the same number of coins and the higher value of coins were picked up faster.

Project Number: MBS021

Grade: 8

Title: Pitch Perfection

Abstract: My purpose is to see if pitch can differ from age, gender, and musical background. I will give the individual a questionnaire asking their age, gender, and how many years they have taken music lessons, and if they will be able to identify three notes on a piano. I will allow the individual to be prepared with a simple twenty second warm up. I will play the notes C,E,G and high C, and using my chromatic tuner, I will determine if the subject is sharp, flat, or on key. I will record my results in my data book.

Project Number: MBS022

Grade: 8

Title: Memory Mnemonics

Abstract: The purpose for this investigation was to discover if adding mnemonics to regular studying techniques increased test scores. Different students (125 total) were tested in 6 different groups that added a different mnemonic device to studying for a short 5 question test. The sixth group was the control group and did not use any mnemonic device for studying. All the test scores were recorded on a data table and compared. According to the data, adding mnemonic devices to regular studying techniques increased test scores. The best mnemonic device will be determined with further analysis of the data.

Project Number: MBS023

Grade: 8

Title: Does shape of a picture frames affect short term memory?

Abstract: The purpose of my experiment is to see which shape picture frames affects a person's memory of the picture the best! My procedures are to first select a person for the test. Explain the directions and select the picture frame being tested. Show the pictures to the test subject for 30 seconds. Remove the picture frame and have the test subject orally list as many pictures as they can. Repeat steps 3-5 for the remaining picture frames. So far in my experiment my conclusion would be for the diamond picture frame to make the test subject remember the most pictures.

Project Number: MBS024

Grade: 7

Title: Are Your Tastebuds Color Blind?

Abstract: If the color of food or beverage is unappealing to the eye, people won't like it. Students from Grades 6 -12 were chosen to do taste tests with normal food and the same type of food altered by color. Food coloring was used. The results showed the naturally colored food that wasn't altered was more appealing to the eye and chosen to taste without hesitation. Students were hesitant to taste the colored food. The hypothesis was supported.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS025

Grade: 7

Title: How does music beat affect blood pressure?

Abstract: The purpose of this investigation is to determine how changes in the tempo of music affect blood pressure. I chose this investigation because I am enjoy different kinds of music. To conduct the investigation I am taking the blood pressure of volunteers before and after listening to samples of music with varying tempos. When I have finished I will compare the average blood pressure readings for each music sample. I have started collecting data but have not finished. All of my results will be available at my display on Fair Day.

Project Number: MBS026

Grade: 7

Title: Are Safety Bottles Really Safe?

Abstract: Four different types of safety bottles were cleaned and labels were removed. Children were then given a 45-second opportunity to open each safety bottle. Data on the success of each child, for each bottle, were then tabulated. Data were evaluated based on gender, age and bottle type.

Project Number: MBS027

Grade: 8

Title: The Stroop Effect

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

Project Number: MBS028

Grade: 7

Title: Commercial Will Be Remembered?

Abstract: The purpose was to determine which type of commercial (bandwagon, repurposed pop song, and celebrity endorsement) is the most effective. The three types of commercials were shown to subjects who were then given quizzes concerning the commercials. The correct answers from the quizzes were measured and recorded. The data was displayed in a data table and bar graph. The subjects answered most correctly for the celebrity endorsement commercial, which was thus the most effective. This commercial was aimed at females who tend to pay more attention

Project Number: MBS029

Grade: 7

Title: Day and Night

Abstract: One thing that people can agree on is that we all need our sleep! But I pull away two people from each gender, I picked two high schoolers and two middle schoolers and take them away from sleep for a 24 hour period. I recorded every hour of what is called a "journal entry " and measured how tired they were with many other things. After sleep depriving my helpers I found that everything the girls did, they got better. But sadly for the boys everything got worse for them. YAWN! I think I'm going to take a nap, I NEED IT!

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS030

Grade: 7

Title: Color vs. Blood Pressure

Abstract: The purpose of my experiment is to test whether color affects a person's blood-pressure. In my procedure, red, green, and blue PowerPoint slides were used as the colors. I measured the subjects' blood-pressures after exposing them to each color for sixty seconds. They rested in between for sixty seconds. The control was black. The average change in blood-pressure between eyes closed and the colors were: red increased by 7.3/4.5 mmHg, green increased by 6.8/5.4 mmHg, and blue decreased by 8.2/4.8 mmHg. Overall, I found that slides of color affected human blood-pressure. Red and green increased blood-pressure; blue decreased it.

Project Number: MBS031

Grade: 8

Title: SCIENCE OF SCENT...

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

Project Number: MBS032

Grade: 7

Title: Computer Vs. Paper

Abstract: I distributed a story on paper to five participants. They each had three minutes to read the story and answer 6 questions. This step was repeated two more times. The five participants then moved to five different computers. Each opened a story and read in on the computer monitor. They had 3 minutes to read and answer 6 questions. This step was repeated two more times. The participants answered 78.2% accurately on paper and 81.6% accuracy on computer. These findings did not support my hypothesis.

Project Number: MBS033

Grade: 8

Title: Rubik's Cube Mental Challenge

Abstract: I selected this topic because I have an interest in Rubik's Cubes. I hoped to prove that someone could use their logic skills and solve patterns presented on a Rubik's Cube. When I gathered everyone, I would make the same pattern on each cube for every person. I would then start the time. After time elapsed, I would collect the cubes, solve them, and count the number of moves. I would repeat that for the rest of the patterns. Most of the students got over fifty moves from the solved position. Students couldn't solve any patterns without previous knowledge.

Project Number: MBS034

Grade: 7

Title: Memory

Abstract: Does chewing gum really help improve memory? If a group of students chewing gum are given a list of words to memorize in a given amount of time in comparison to those not chewing gum, then the chewing group will test better. Students were given tests, timed, and then data was recorded. The results of my testing proved my hypothesis that chewing gum does indeed help memory.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS035

Grade: 7

Title: Montessori vs. Traditional Education, Phase 2: A Comparison of Conservation Concepts Between Public and Private pre-primary Montessori and Traditional Education

Abstract: This project expanded on previous research investigating educational differences between Montessori and traditional education. The purpose of this project was to compare Montessori pre-primary students enrolled in both a public magnet school and a private school with a traditionally educated classroom with simple conservation concepts of mass and volume. Because Montessori educational materials are tactile and interactive, and because private schools do not have the constraints of public schools, it was hypothesized that the private Montessori students would have already attained knowledge of conservation of mass and volume. Preschool children enrolled in both Montessori and traditional classrooms and in private Montessori school were interviewed. The interviews were conducted to emulate the original interviews of Jean Piaget. Students were interviewed on conservation of mass and conservation of volume principles. Informed consent of both students and parents was obtained and privacy of the students was maintained with pseudonyms. Data collected from the interviews was analyzed using frequency distributions for students' responses to each question. The aggregate data was then analyzed to determine if a statistical difference existed between the three groups of students. Results from a series of $f(2)$ tests indicated that both public and private Montessori students performed significantly better ($p=0.001$) than traditional students on conservation of mass and volume principles.

Project Number: MBS036

Grade: 7

Title: Cascades: Going With The Crowd

Abstract: My experiment's goal was to examine a phenomenon called an 'information cascade' in teenagers and compare it to its frequency in adults. A cascade is formed when an individual mimics the behavior of their peers, ignoring any personal information about the decision that they may have. My experiment required subjects to record their decision on whether or not to "buy" a product based on a written scenario simulating a real world cascade. Based on my data and observations, Adults exhibit this tendency to "go with the crowd" more than teenagers, which was the opposite of my hypothesis.

Project Number: MBS037

Grade: 7

Title: See Hear? What were the numbers?

Abstract: In my project, I tested if the human memory remembered better by seeing or hearing a series of numbers. To do this I used ten people and had them remember a series of numbers and repeat them out loud to me in two different ways. My hypothesis, which was proven correct, was that they would prefer when it was read to them, rather than them reading it to themselves. In the end, the results were that 70% of the people preferred it when I said it out loud and 30% preferred when they read it themselves.

Project Number: MBS038

Grade: 8

Title: Do Teachers Rock?

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

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS039

Grade: 8

Title: Turn The Volume Down!

Abstract: I am testing whether you can listen to something you like louder than something you do not like. I will have ten students listen to something they like as loud as possible before they say it is too loud. Then I will have them listen to something they do not like until they say it is too loud. After testing ten students, I will make a conclusion, judging by the differences in final sound level between the two sounds if there are any.

Project Number: MBS040

Grade: 8

Title: Does Cell Phone Use Effect Reaction Time?

Abstract: Test subjects were contacted via cell phone and asked a series of general knowledge questions. While conducting the telephone conversation, test subjects were asked to complete a simple word search puzzle. A control word search puzzle also was completed by each test subject. Data were evaluated as a whole and based on gender and age.

Project Number: MBS041

Grade: 7

Title: Gender and Peer Pressure

Abstract: My experiment was to determine which gender was impacted more by peer pressure. I hypothesized that females would be more affected by peer pressure. To prepare for my experiment, I created a questionnaire, and I collected permission slips for each of my subjects. I gathered the female subjects (and then the males), gave them instructions and allowed them to complete the questions individually. Then I gave the questions to the group orally, allowed them to write their answers again, and compared their responses to their original answers. My results showed that females were more affected by peer pressure.

Project Number: MBS042

Grade: 8

Title: Rat Pack Intelligence

Abstract: The purpose of this experiment was to see how the socialization of rats affects their intelligence. Rats are very social creatures and lack of socialization would affect their intelligence. Rats can become depressed, ill, or sometimes die earlier when not around other rats. If not being around other rats can cause these drastic changes why would it not cause a drop in intelligence. Biologists would be interested in the results of this experiment.

Project Number: MBS043

Grade: 8

Title: What Is Your Body Saying?

Abstract: The purpose of this experiment was to see if body language indicates your personality type. To conduct this experiment determine twenty-four subjects' personality and determine if their body language matches their personality type. The experimental results were measured by the overall responses of the twenty-four subjects, gender, and age. The results of the experiment were that 59% of the test subjects responded opposite of their personality.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Girls followed their personality more than the boys and the eldest group followed their personality most. The results show that the hypothesis should be both accepted and rejected.

Project Number: MBS044

Grade: 7

Title: Teachers Behaviors that drive me NUTS!

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

Project Number: MBS045

Grade: 8

Title: Autism

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

Project Number: MBS046

Grade: 8

Title: Can Adults Pass a Middle School Test?

Abstract: The purpose of this experiment was to determine if the test **Grade** will change with age. This researcher asked eighth **Grade** students to take a test based on the review of all their core classes and then this researcher asked adults to take the same test. Based on the data, the test **Grades** for the adults were usually lower than the test **Grades** for the students. The test **Grades** were not as low as predicted, but the average anxiety level was higher with adults than with students. Further analysis of the data may show other results.

Project Number: MBS047

Grade: 8

Title: Is Yawning Contagious?

Abstract: Yawning is an everyday activity. In truth all people yawn, but does that mean yawning is contagious? The purpose of this project was to determine if the number of people in a room changes will the amount of contagious yawning also change. This researcher tested this by sitting with people in a room and observing them for a total of 5 minutes while watching to see if there were any yawns. As of this date, the data indicates that the number of people per room does not increase the amount or frequency of yawning.

Project Number: MBS048

Grade: 8

Title: Memory Challenge

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

Project Number: MBS049

Grade: 8

Title: Stroop Effect Test

Abstract: The purpose of this investigation was to determine how fast a person can say words while the words are twisted. Sixth, seventh, and eight Graders were tested using a Stroop test

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

until I got 10 boys and 10 girls in each Grade. Each student received the same test and this researcher recorded how long each student needed to say the words on the test. Analysis of the data determined the group with the highest test scores and times. Up to this point, the data has showed several differences among the groups.

Project Number: MBS050

Grade: 8

Title: Does Color Affect the Memorization Ability of Students?

Abstract: Eighth **Grade** students were given memory skill tests in one of four different font colors over the course of a few weeks. Data were evaluated as a whole and based on gender.

Project Number: MBS051

Grade: 8

Title: Does Age Effect the Way You View Facial Expressions

Abstract: The purpose for this investigation was to determine if age affects the way humans view facial expressions. 50 adolescents participated by identifying the emotion portrayed by a facial expression on a researcher created test. Additionally, 50 adults received the same test and same instructions. This researcher analyzed the data to determine which age group was able to correctly identify the emotions shown on the different facial expressions. The data showed that age did influence ability to correctly identify emotions.

Project Number: MBS052

Grade: 8

Title: Now Back To Me. . .

Abstract: Anticipating a generation's character can show what jobs they'll want, what kind of government they'll elect and ultimately their reputation as a people. But how can one forecast a generation's traits? This was my project in a nutshell. I surveyed 50 students within the Millennium Generation (b. 1980-) using multiple instruments concerning self-esteem, en**T**itlement and awareness. Of the subjects who said they knew a lot about 9/11, 86% could not answer even two of the three basic questions regarding the event. This generation shared no common ground with any other generation. Generally, they were en**T**itled, ignorant and narcissistic.

Project Number: MBS053

Grade: 7

Title: Be Cute or Get the Boot!

Abstract: By selecting random people at a shopping mall, will they respond differently to a person in need that is dressed in poor attire or high class attire? The higher class person will receive the greater attention. A series of questions were asked to random people and the results showed the hypothesis was supported. People respond better to those whose appearance is more appealing to the eye.

BEHAVIORAL AND SOCIAL SCIENCE - INTERMEDIATE (7TH-8TH GRADES) - MBS

Project Number: MBS054

Grade: 7

Title: Gender Sterotypes in Children

Abstract: The purpose was to determine whether people use stereotypical adjectives to describe gender. A photograph of a baby was shown to subjects who were divided into 3 groups. The first group was told that the baby was male, the second group was told that the baby was female, no gender was mentioned to the third group. Each subject was given a list of adjectives, which contained passive, aggressive, and neutral adjectives. Each subject was told to circle any that applied to the baby in the photograph. The responses of the subjects were measured and recorded. Most subjects choose adjectives that are stereotypes for the genders because most people apply gender-specific adjectives.

Project Number: MBS055

Grade: 7

Title: Tell Tale Heart

Abstract: In this science fair project the affect of music on heart rate was tested. The experimental participants were exposed to hip-hop and classical music to test if music affects heart rate. The data was collected in heart beat measurements (beats per minute, bpm). These measurements were taken once before listening to the music and twice after listening to the music. These data measurements were analyzed using an analysis of variance. After this testing, it was found that hip-hop did significantly change heart rate but classical did not.

Project Number: MBS056

Grade: 8

Title: How Does Fashion Impact The Behavior of Others?

Abstract: "Don't judge a book by its cover!" Every day people are making first impressions and sometimes don't even realize that they do that. Without knowing somebody, the natural reaction is to judge a person based on their physical aspects; like the clothes they wear, body shape, etc. In this experiment students were asked to complete a survey asking for a descriptive adjective for each picture shown and then additional questions about their favorite picture. Data collected thus far shows a more feminine style is favored by male and female students tested. Further analysis may show other comparisons.

Project Number: MBS057

Grade: 8

Title: Does Music Make You Run Faster?

Abstract: I did my project on does music make you fun faster? In my project i had six kids run for laps around the gym. Four with no music, four with slow music, and four with fast music. i wanted to see if you could run faster with music. My hypothesis was right you ran faster with the fast beating music, then no music, then slow. I got my hypothesis from my research that music increase your blood pressure up to 10% and it relaxes your muscles.

**BEHAVIORAL AND SOCIAL SCIENCE -
INTERMEDIATE (7TH-8TH GRADES) - MBS**

Project Number: MBS058

Grade: 7

Title: Memorize Me

Abstract: In my project, I tested eight volunteers with four different methods of learning, mnemonics, rehearsal, association, and music. I assigned them all a method of learning, and had them study a string of numbers and letters using their assigned method of learning for fifteen seconds. Then, I had them all write down all the numbers and letters they remembered. In the end, I discovered that the people who studied the letters and numbers using rehearsal and association as their method of learning got higher scores.

Project Number: MBS059

Grade: 8

Title: Swoosh

Abstract: I am testing whether people shoot better with a high arc or a low arc. I think you will shoot better with a high rather than a low arc. If you shoot with a high arc the hoop becomes bigger so you have a greater chance of making it. My hypothesis was proven correct.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI001

Grade: 7

Title: Nothin' But Net?

Abstract: I did this experiment to see if a basketball net's presence or absence effects free throw accuracy. I hypothesize that more shots will be made with the net on rather than off. I tested this by having 3 sixth **Grade** boys, 3 sixth **Grade** girls, 3 seventh **Grade** boys, and 3 seventh **Grade** girls shoot 10 free throws each with the net on. Then I removed the net and had each person shoot another 10 free throws. I recorded each person's results after they shot both times. My hypothesis was correct because more shots were made with the net on.

Project Number: MBI002

Grade: 7

Title: Do Magnets Affect Plant Growth?

Abstract: The purpose was to determine if placing radish plants by magnets affected their heights. Two groups of plants were grown: one with magnets and one without magnets. After 6 weeks the heights of the radish plants were measured and recorded. The data was displayed in a data table and line graph. The radish plants grown with magnets grew the tallest because radish plants contain iron and were, thus, attracted to the magnets.

Project Number: MBI003

Grade: 8

Title: Genetically Enhanced Soybean Seed Versus Regular Soybean Seed

Abstract: The purpose of my project was to determine for my Grandfather type of seed is best. I first gathered soybean plants from my Grandfather's farm. I counted and recorded the beans per plant, pods per plant, and average beans per pod. I also took soil samples from the fields I gathered the plants from. I found that genetically enhanced soybean seed had better beans per pod average however; the regular seed had better beans per plant and pods per plant. My conclusion is that the regular soybean seed produces a higher yield for my Grandfather.

Project Number: MBI004

Grade: 8

Title: Which Pot Is the Best?

Abstract: The purpose of the experiment was to follow the growth of the Christmas cactus seed in different types of pots such as clay, plastic and ceramic. Each pot was given 34 ounces of soil. The type of soil was Scott's potting soil. Every pot was watered with $\frac{1}{4}$ cup of water every other day. Each plant was in the same environment and got the same amount of sunlight through the whole experiment. The plants growth was measured once a week. The conclusion is the data shows that the clay pot was the best at 11cm. The ceramic grew 3cm. The plastic grew none. Therefore, the Christmas cactus plants grow the best in clay pots. The first sprouting was on January 10th but it wasn't measured. The next day was a week so it was measured and the growth for the clay pot was 8cm, the ceramic was 2cm and the plastic still grew none all through the experiment.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI005

Grade: 8

Title: What type of biodegradable bag will deGrade the fastest?

Abstract: The reason I chose this experiment was because I wanted to see if I was being wasteful when I threw away bags. The procedures I used that I weighed each bag, buried them, and dug them up a week later. I then weighed them again. I found out that the bags had decreased at low rate and all decrease the same. The regular chip bags did not decrease at all. I concluded that biodegradable bags all decomposed at the same rate and at very low rate within one week and the chip bags did not at all.

Project Number: MBI006

Grade: 7

Title: Do you Nose what that smell is?

Abstract: My project was to see if adults have a better sense of smell than kids. I believe that children will have a better sense of smell. My research stated that our sense of smell starts to increase until about eight years old, then starts decline around age 15. I gathered my participants, scents, and a tracking sheet. I gave the scents to my participants and they told me what they thought it was. I analyzed my results by grouping them: under 15 years old, 15-30 years old, and above 30 years old. The 15-30 year olds did best.

Project Number: MBI007

Grade: 8

Title: Liquids Affect on bone

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

Project Number: MBI008

Grade: 8

Title: Does Gender Influence the Notes You Can Sing?

Abstract: This project tested different genders to determine if there was a difference between the amounts of notes each gender was able to sing. The participants were required to sing a scale from Do to Do to warm-up, and then each participant started at the beginning of the scale and sang each note until he/she could not "hit" the note. This researcher recorded the posture and the amount of notes each participant could sing. So far, the data showed that the genders have similar abilities to sing notes. Further analysis of data may identify other differences.

Project Number: MBI009

Grade: 8

Title: Fertilizer's Affect of Algal Growth

Abstract: The purpose of this experiment was to find out if fertilizer affects the growth of algae. To conduct this experiment I added different amounts of sodium nitrate to different test tubes that consisted of soil water, algae, and spring water. The absorbance rates were measured using a light spectrophotometer every other day for two weeks. The results of this experiment showed that the sodium nitrate did have effects on algal growth in both cases. However, the effects of sodium nitrate varied between Euglena and Chlamydomonas. This evidence shows that my hypothesis was partly correct.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI010

Grade: 7

Title: Got Spit?

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

Project Number: MBI012

Grade: 8

Title: Organic and Inorganic Tomatoes

Abstract: The purpose was to determine if organic or inorganic tomatoes produce the most juice. Both organic and inorganic tomatoes of the same mass were mashed and juiced. The amounts of juice produced by both types of tomatoes were measured and recorded. The data was displayed in a data table and bar graph. The inorganic tomatoes produced the most juice because inorganic tomatoes are often genetically modified to be juicier.

Project Number: MBI013

Grade: 7

Title: Magnetic Effects on Plants

Abstract: How do magnets affect plant growth? I wanted to do this project because I love plants and I wanted to know if they were attracted to magnets. I used three different strength magnets. The magnets were strong, stronger, and strongest. I tested them to find their strengths with paper clips. Then I planted the Narcissus blubs. After they grew to 5cm, I attached the magnets to metal rods and placed them in the soil of the Narcissus plants: Magnet 1 in Pot 1, Magnet 2 in Pot 2 etc. Thus I concluded that my hypothesis was proven wrong. The strongest magnet didn't attract the plant at a greater angle. The strongest magnet actually repelled the plant the most.

Project Number: MBI014

Grade: 7

Title: H₂O₂: Harmful or Helpful

Abstract: The purpose of this project was to find out if hydrogen peroxide helps plant growth or prevents bacterial growth on plants. There were two parts to this experiment. The first will explore how much hydrogen peroxide affects seed germination and the second will explore the affects of hydrogen peroxide on plant cuttings. These experiments will prove if hydrogen peroxide is harmful or helpful in different stages of plant growth. After growing 40 seeds and 24 plant cuttings in different concentrations of hydrogen peroxide, results show that hydrogen peroxide slows seed germination, can help plant growth and can prevent bacterial growth.

Project Number: MBI015

Grade: 8

Title: Worm Reproduction

Abstract: The purpose of this experiment was to see what type of soil is best for a worm to survive and reproduce in: regular garden soil, peat moss, mulch, or all of them combined? Therefore, which one of these soils would be best to use in a composting bin? A combination of soil, peat moss, and mulch combined was thought to create the most suitable environment for worms to multiply. Biologist, Environmentalists, and Entomologists would be interested in the results of this experiment.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI016

Grade: 7

Title: Dye in Gel

Abstract: Which color dye macromolecules travel the farthest through the gel electrophoresis chamber in a set amount of time? A gel electrophoresis chamber was constructed and loaded with dye. An electrical current was applied, causing the food coloring molecules to migrate through the gel chamber. The dye distance was observed and recorded every 10 - 15 minutes. The hypothesis was the lighter colors would travel faster through the gel chamber. The results showed the dark red traveled farther than the light red. Therefore, my hypothesis was not supported.

Project Number: MBI017

Grade: 8

Title: Cultivation Methods on the Growth of Ocimum Basilicum

Abstract: The purpose of my experiment was to discover which of five cultivation methods produced the biggest plants. I hoped the plants grown hydroponically would grow the best since it's an efficient way to grow. I planted basil seeds in top soil. Once big enough, I transplanted them to each cultivation method. After two weeks of measuring plants, I compared my results. After comparing, I found that the fertilized potting soil cultivated the plants with the most growth. Basil in this medium almost doubled in height. My results show that soil and water can be just as beneficial as high-tech equipment.

Project Number: MBI018

Grade: 8

Title: Crossed or Not Crossed

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

Project Number: MBI019

Grade: 7

Title: Growing Green!

Abstract: To see if dehumidifier water has an effect on the growth of plants, a test was designed using four different types of water. Two dehumidifiers were used in this project, one brand new and one that has already been used. The new dehumidifier was cleaned to see if the water from it had an effect on the plants. 80 Lima Bush bean plants were tested by being watered with the clean dehumidifier water, dehumidifier water, tap water, and distilled water which is my control. The plants were then biomassed and the results were graphed.

Project Number: MBI020

Grade: 7

Title: Cut out the caffeine?

Abstract: "Cut out the caffeine" will attempt to prove that caffeine can raise your blood pressure. I will drink coffee, tea, and soda and record my blood pressure to see if there is a difference between my resting rate and the rate after I consumed these caffeinated beverages. Results will be found once my experiments have concluded.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI021

Grade: 8

Title: Which color of light do plants respond best to?

Abstract: The purpose of my experiment is to find out whether plants respond differently to various colors of lighting. I used Great Northern Bean plants. To test the lighting, I covered windows on the north east side of my house with red, yellow, green, and blue cellophane. I gave each plant the same amount of water. The plants were measured every three days by height and number of leaves. Testing is still being conducted so no conclusion has been determined.

Project Number: MBI022

Grade: 7

Title: Passing Down the Family Genes

Abstract: The study of genetics/inherited traits is more than simply tracing back or predicting eye and hair color. Our genetic code is specific from one person to another. The fact that living things inherit traits from their parents has been used since prehistoric times to improve crop plants and animals through selective breeding. We do pass on other, more "unusual" traits, such as the ability to distinguish specific tastes in foods. In this science fair project, I will conduct genetic tests on 15 family members focusing my final analysis on taste. Each person will be asked to taste PTC, Thiourea, and Sodium Benzoate test papers to determine whether he/she is a taster or non-taster of the taste strips indicating if the person inherited the dominant or recessive gene from their parents. The ability to taste PTC and Thiourea is entirely genetic. I will use Punnett Squares to predict the outcome each family's genetic inheritance of the taste gene.

Project Number: MBI023

Grade: 7

Title: Gravitropism

Abstract: I did this project to see whether direction of planting affects positive gravitropism. First a selection of 3 corn seeds were placed into circular dishes and enclosed in water soaked paper towels. Three seeds were placed into each dish with points of the corn seeds facing up, down, right, and left. The four dishes were placed upright on modeling clay brackets to prevent the roots growing into the paper-towels. They then were placed into a dark place for germination. Photographs were taken every other night to show growth. At the end of a week, I took them out and measured the angle the root had turned. My conclusion is that my hypothesis was proven correct.

Project Number: MBI024

Grade: 7

Title: pH or no pH

Abstract: The purpose of my project is to see whether lima bean plants grow better in a higher or lower pH of water. I chose this because I was interested in finding out the answer. It could be very helpful to gardeners and even teachers because they usually grow bean plants with their class. A lot of families grow lima bean plants with their children as a way of gaining responsibility by watering every day. Don't you think a child would much rather see a tall plant or one that is barely sprouting? These are some reasons why I chose this project. Another is because I thought it would be a project that I enjoy. My hypothesis was that when the pH of water reaches level seven, the growth will increase. I tested my hypothesis by changing the pH of water by using pH test strips, pH Up and pH Down. I measured the height of the lima

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

beans by using the proper units to track growth. The conclusion is that the plant that was watered with a pH level of 8.5 grew the tallest. It grew to be 63.5 centimeters.

Project Number: MBI025

Grade: 7

Title: Under what color light do plants grow the best?

Abstract: The purpose of the investigator's experiment was to see what color light will help plants to grow their best. She took 36 plants and grew them from seeds. She placed 6 plants under each of the following colors of light: blue, white, red, green, yellow and black. For six weeks, she recorded the height of the plants and the number of leaves on each plant. Her conclusion was that overall, plants grew tallest and sprouted the most leaves under red light.

Project Number: MBI026

Grade: 8

Title: Keep Oil Out of the Equation

Abstract: The purpose of this experiment was to determine the effect of motor oil on Mountain Laurel leaves. Four leaves were collected and over a period of three days measured (drops) amounts of oil were administered to three of the four leaves. Each day the results were logged in a composition notebook. Minimal browning occurred, however the leaves did curl in towards the stems. Being that the leaves were hardy and weather-resistant, three days was not enough time to provide sufficient results.

Project Number: MBI027

Grade: 8

Title: Black Eyed Peas: Not Just a Band

Abstract: The purpose of this experiment was to test whether the nutrients from homemade compost will let a plant grow better than a plant watered with commercial fertilizer using hydroponics. Are people paying too much for their plants? Using homemade compost would be a lot cheaper. It was predicted that the nutrients from the homemade compost would work better. Botanists, Biologists, and Consumer Scientists would be interested in the results of this experiment.

Project Number: MBI028

Grade: 7

Title: Can bread mold be transferred to other foods?

Abstract: The purpose I chose this project is to see if bread mold can be transferred to other foods. The procedures are to get 3 loaves of bread and with the eye dropper drop 15 drops of water on each loaf of bread and place them in a plastic bag, after 2-3 weeks mold should be growing on the bread, then cut an orange or banana in half and shake the moldy bread over one of the cut orange or banana and place the other one in a plastic bag. Then discard moldy bread.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI029

Grade: 7

Title: Caffeine and Plants

Abstract: The purpose was to determine if caffeine affects the height of red kidney bean plants. Two groups of red kidney bean plants were grown: one with caffeine tablets added to the soil of each plant and the other without caffeine tablets. The height of each plant was measured and recorded at one week, two weeks, and three weeks. The data was displayed in a data table and a bar graph for final heights. The plants without caffeine tablets added were the tallest. Caffeine is not healthy for plants.

Project Number: MBI030

Grade: 8

Title: The Nose Knows Smell but How About Taste?

Abstract: This experiment determined if a person can taste the 4 different taste categories using the sense of smell. This researcher surveyed 90 volunteers. These volunteers were asked to put on a pair of goggles with a dark paper on the front, smell all of the different foods and then taste them. This researcher recorded the time they took to identify the food, and whether or not the food was identified correctly. The data showed that the nose can affect the ability to taste.

Project Number: MBI031

Grade: 8

Title: What to Drink When Exercising

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

Project Number: MBI032

Grade: 8

Title: Soap...Good or Bad?

Abstract: This experiment was chosen because it helps people know if soap is good or bad for plants so they don't harm the environment. First, label the cups A-D, add the soil, and put the plant in. Next, add water to the plant. Then, put soap in Plant B, C, and D, but not plant A. Finally, record the height of the plants. Plant A was the biggest and healthiest at 4 inches with brown soil. Plant B was the next biggest and healthiest out of the other plants with soap. It was 3 inches with orange soil. Plant C was bigger and healthier than plant D. It was 1 ½ inches with orange soil. Plant D was dead with brown leaves and orange soil. The hypothesis was supported by the data and soap is not good for plants. If you use soap with plants, they will die but if you use "grey" water, it shouldn't harm the plants.

Project Number: MBI033

Grade: 7

Title: Caudal Autotomy: Tail loss and regeneration in green anoles

Abstract: The purpose of my experiment was to determine if green Anoles will regenerate a tail that is artificially removed as well as if it was naturally removed. The tail of a green Anole was artificially removed using a razor while the tail of another was removed by natural means. Then the quality and rate of tail regeneration was observed and recorded over time. The data collected enabled me to conclude that their ability to regenerate their tail is negatively affected when their tail is removed artificially.

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI034

Grade: 8

Title: What Affects Ability to Hear Pitch?

Abstract: For this project I wanted to explore the factors affecting pitch perception. To do this I created a survey asking questions about age, gender, and musical background. I then created an online test that played computer generated tones and could calculate someone's ability to determine pitch. Once I had 59 respondents to the test, I analyzed that people who played instruments frequently and for many years could identify pitch well. Age, Gender, and musical reading had mostly no effect. These results are important to know if someone is trying to succeed in becoming a musician.

Project Number: MBI035

Grade: 8

Title: Toxic Waters

Abstract: Water covers 75 percent of our planet and is the greatest resource on this planet; of that water only 2 percent of it is drinkable. Human-created toxins pollute this small amount of water. The toxins not destroy the organisms that inhabit the ecosystems and render the properties of the ecosystems, thus destroying the environment. My experiment shows the effects of these different toxins and how they destroy the homes of freshwater ecosystems.

Project Number: MBI036

Grade: 8

Title: Organic or Effective Fertilizer? Answer: Both

Abstract: My project, entitled "Organic or Effective Fertilizer? Answer: Both." is about testing whether or not various household items can be combined to create an organic and effective fertilizer. I grew plants over a 14 week process, using a control of no fertilizer, pots containing a commercial, store bought fertilizer, and the last pots containing my homemade fertilizer mix. My hypothesis was that the homemade fertilizer would drastically improve plant height, yet would be outgrown by the commercial brand. At the end of the experiment, my hypothesis was proven correct.

Project Number: MBI037

Grade: 7

Title: Ultraviolet Light on Glofish Fluorescence

Abstract: Scientists have genetically engineered Zebra danios into fluorescent Glofish as a first step toward creating a pollution detecting system. In polluted waters, greater fluorescence will enhance the pollution detecting ability of Glofish. Can an environmental stimulus of UV light cause the Glofish to have increased fluorescence? Control Group A has no UV light. Expose Group B to 1 hour of UV light per day for 1 week. Group C was exposed 2 hrs. per day for 1 week. Group D was exposed to 4 hrs. per day for 1 week. For the next week, do not expose fish to UV light. Measure fluorescence with LUX meter on Day 8 and Day 15.

Project Number: MBI038

Grade: 7

Title: Oil Spills and Photosynthesis

Abstract: Everybody has heard about the gulf oil spill that happened last year. This work was intended to see if aquatic plants were affected by a simulated oil spill. One plant was put in a

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

container with a device over it that trapped the air it produced and allowed me to measure it over a 12 hour period. The first time was done with no oil, the second with oil. I found out oil spills do block the light to a plant and cause it to make much less oxygen than normal, meaning plants are affected by oil spills.

Project Number: MBI039

Grade: 7

Title: Does Medicine Affect Transpiration?

Abstract: Given that it is believed pain relievers like aspirin open animal veins for blood flow, this project experiments with the idea that it likewise opens vessels in plants. To assess the similarities between human and plant veins in an effort to improve plant production, the project introduced various pain relievers into plants as they absorb water and other nutrients from the soil. It was believed that the aspirin would work best in plants as it performs this function the best in animals. By diluting the pain relievers in distilled water and introducing them to exotic angel plants, the scientist examined and recorded the transpiration level in each plant. The conclusion showed that the hypothesis was supported: aspirin-treated plants produced the highest amount of transpired water.

Project Number: MBI040

Grade: 8

Title: The Effects of Salinity on Seed Germination and Early Growth

Abstract: The purpose of this experiment is to determine whether salinity has an effect on the germination and subsequent growth of bean and radish seeds. A germination center was constructed. Seeds were given one of four treatments: 200mL of distilled water with no salt (control), 1.25mL of salt, 2.5mL of salt, and 3.75mL of salt. After germination, the seeds were planted and watered daily with distilled water. As hypothesized, the results indicate that salinity did have a large negative effect on seed germination and that bean seeds were more affected than radish seeds. Preliminary results also showed that high levels of salinity in the germination stage had no effects on subsequent growth. This suggests that the negative effects of salinity during germination can be offset during early growth. Research is still being conducted. Final abstract will be available at my exhibit on Fair Day.

Project Number: MBI041

Grade: 7

Title: Which Items Have More Bacteria?

Abstract: The purpose of this experiment was to find which items collect more bacteria. To conduct this experiment I swabbed six common items. I placed them under UV lights for 7 days. The experimental results were measured by the number of bacteria colonies that were collected. The results of this experiment were that the toilet collected the most bacteria of the common items. The money collected the fifth most bacteria of the six common items. The results indicate that the hypothesis should be rejected because it said that the money would collect the most bacteria of the common items.

Project Number: MBI042

Grade: 8

Title: Molecular Scissors

Abstract: Restriction enzymes can prevent and treat hereditary diseases through pharmaceutical products. A random piece of DNA was generated using Random Sequence

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Generator on line. Restriction cuts for the DNA sequence were created using NEB cutter program. The experiment was conducted on 20, 40 and 60 base pair length as well as for the induced variations in the DNA sequences. Increasing the number of base pairs increased the number of restriction cuts. There were more unique than common cutters identified. Inducing variation in the DNA sequence produced changes. In conclusion, restriction enzymes are unique to specific DNA sequences.

Project Number: MBI043

Grade: 8

Title: Gembusters: Spices with Anti-Bacterial Properties

Abstract: My investigative question was: Do spices have anti-bacterial properties? I tested 5 spices that were promoted for their anti-bacterial properties; Turmeric, Cinnamon, Black Pepper, Garlic, and Ginger. After pouring 5 mL of milk into 25 test tubes, I added .1g of a spice into 5 test tubes and repeated this step for each spice, and then added a drop of Methylene Blue. My data showed that all five spices tested had anti-bacterial properties because they prolonged the time that it took for the milk's oxygen

Project Number: MBI044

Grade: 8

Title: Organic Fertilizers around the House

Abstract: My experiment was based on different common household items being used as organic fertilizers instead of a store bought fertilizer. For this experiment, I used marigold seeds and fertilize them with banana peels and tea bags at a regular interval. The plant growth was used as a measurement criteria for the experiment. In conclusion, based on the plant growth, I found that common household items can be used as organic fertilizers. Out of the two homemade fertilizers I used, banana peels had the most effect for plant growth.

Project Number: MBI045

Grade: 7

Title: Green Light or Blue Light

Abstract: Using various light colors to see if they have an effect on the growth of radish seeds.

Project Number: MBI046

Grade: 7

Title: Under which type of light will plants grow the tallest?

Abstract: The purpose of this investigation is to find out under which type of light plants will grow the tallest. I will expose groups of plants to natural light, no light, incandescent light, florescent light, and UV light. I will then average the height of the plants in each group.

Project Number: MBI047

Grade: 8

Title: A Handle on Bacteria

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

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Project Number: MBI048

Grade: 8

Title: Energy With Mealworms

Abstract: For my project, I will be testing what affects energy drinks such as Red Bull and Gatorade, have on mealworms. First, I will measure and take the weight of each worm. I have three bins set up in categories and ten cups are inside each bin. One will contain the ten worms with the Red Bull, one with the worms and Gatorade, and third will be worms living on regular oats and water. Through two weeks, I will enter the amount of each liquid into each cup with a dropper and take observations. I will then compare my results and predict what affects these energy drinks will have on people through the results on what affects took place on the worms

Project Number: MBI049

Grade: 8

Title: Temperature and Plant Growth

Abstract: The purpose was to determine if plant height is affected by watering with cold, room-temperature, or hot water. Plants were watered with water at different temperatures, and their heights were recorded at the end of 6 weeks. The data was presented in a data table and bar graph. There was no significant difference among the average heights of the plants.

Project Number: MBI050

Grade: 7

Title: The Stink Bug War

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

Project Number: MBI051

Grade: 7

Title: How Detergent Affects Plant Growth

Abstract: The purpose of my experiment is to find out whether laundry detergent can be used as a fertilizer. I am going to give plants different amounts of detergent in their water. I will measure the plants to determine which plants have grown the most. I do not yet have data or conclusions as I am still experimenting.

Project Number: MBI052

Grade: 7

Title: Coffee Crazy

Abstract: My experiment was to test how the caffeine in coffee can affect blood pressure. I had each test subject drink 120 milliliters of coffee, and then I measured their blood pressure. More people who drank decaffeinated coffee had an increase in blood pressure than those who drank half-caffeinated. However, caffeinated coffee spiked an increase in more people than any other coffee. My hypothesis was proven correct: the most people experienced an increase in blood pressure when they drank regular, caffeinated coffee.

Project Number: MBI053

Grade: 7

Title: Does Age Affect Memory?

BIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MBI

Abstract: The purpose of this experiment is to determine if age affects memory. I hope to learn if the age group I selected in my hypothesis has the best memory. Participants have thirty seconds to review a list of ten words. After two minutes, participants receive a list of thirty words containing the original ten words. Participants have forty five seconds to circle the original ten words. The age group of 21 to 30 had the best memory. This is not what I had predicted in my hypothesis. My hypothesis was denied. There are many other factors that affect one's memory.

Project Number: MBI054

Grade: 8

Title: Nicotine and Cancer Cell Growth

Abstract: The purpose of this experiment was to figure out how liquid nicotine affected the proliferation of a cancer cell. To test this I added liquid nicotine, to the cultural media of pancreatic tumor cells at several different doses. I counted the total number of cells at time zero, 24 and 48 hours, by Trypan blue exclusion technique. I observed that the number of cells were higher when low dose of nicotine was present but lower at high doses. The results indicate that the hypothesis should be accepted because; the cells did proliferate when nicotine was presented at low concentration.

Project Number: MBI055

Grade: 8

Title: Hydroponics, Green-house hydroponics, and soil

Abstract: Many gardening techniques are used in the world. This study will be determining how different techniques affect the growth of cabbage plants. Cabbages will be grown in a potted setting, a liquid hydroponic setting, and an aggregate hydroponic setting. The growth will be determined by the mass of the plant after twelve weeks.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH001

Grade: 8

Title: Glowing In The Dark

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

Project Number: MCH002

Grade: 7

Title: Enzymes at Work

Abstract: Enzymes do many different things-they speed up chemical reactions, they help digest food, they aid in the process of providing cellular energy, they support the brain functions, they detoxify blood, and some other things. If we did not have enzymes in our bodies, our bodies would not be able to function properly. This experiment is intended to help figure out how acidic a pH level has to be to change an enzymes' shape. Different items will be used (such as apples, potatoes, salty water, and lemon juice) to determine if plain air, lemon juice, and salty water causes enzymes to change their shapes (I will know by how long it takes for the solid foods to brown; if it takes a long time, then the pH is acidic enough-in the liquids only-to change the enzymes' shape).

Project Number: MCH003

Grade: 8

Title: The Effect of Decongestants/Pain Killers on Stomach

Abstract: The purpose of my experiment is to see which decongestant/pain killer works the fastest. During the experiment, I put a tablet of a certain drug into a beaker filled with 20 mL of simulated stomach acid and timed how long it took to dissolve. I hope to obtain accurate results that people can use effectively. My data did not support my hypothesis. These are my results in order: Equaline Aspirin, Advil, Tylenol, Rite-Aid Aspirin, and Aleve. People who take these drugs may benefit from my experiment, especially if they need it to react fairly quickly.

Project Number: MCH004

Grade: 7

Title: Surface Tension

Abstract: The purpose of my experiment was to see if adding salt while increasing the water temperature would increase or decrease the surface tension. I did this by putting a bottle cap in each beaker that was filled with 200mL. of water. One had 2 tablespoons of salt. I kept putting popcorn seeds in the bottle cap until the bottle cap sank. It took less popcorn seeds to sink the bottle cap in pure water than in salt water. My hypothesis should be accepted because I stated that while increasing the water temperature the surface tension would increase.

Project Number: MCH005

Grade: 8

Title: Which wood is the wood for you?

Abstract: I tested to see which wood has the highest burning potential. I selected my types of wood by researching popular types of firewood. I wanted to do this experiment because many people burn wood either industrially, in their homes or while camping. It is important that they buy the correct type of wood. I used a calorimeter to record my data and come to a conclusion. In my data the hard woods performed quite similarly with the softwoods except for

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

cedar, which was the worst. I concluded that when measured by mass woods have very similar burning potential.

Project Number: MCH006

Grade: 7

Title: Bed Sheet Flammability Testing

Abstract: The purpose of my experiment was to determine if repeated washings of bed sheets in Borax will decrease its ability to burn. In Part one the burn rate of 30 fabric samples of a white bed sheet not washed (control), 30 samples washed and rinsed once, and 30 samples washed and rinsed three times were tested. In Part two the burn rate of 30 samples washed once but not rinsed and 30 fabric samples washed three times but not rinsed were tested. The data collected enabled me to conclude that repeated washings decrease the ability of the fabric to burn.

Project Number: MCH007

Grade: 8

Title: Peppers and Vitamin C

Abstract: This project was chosen to provide information on the benefits of eating bell peppers. I chose five peppers and liquefied them. I prepared the 1mg/1mL solution of vitamin C. To prepare the starch solution, I used corn starch and boiling water. I added the starch solution to the vitamin C solution. Using 2% iodine solution, I dropped it into the vitamin C and starch solution, counting the drops. I repeated this test using each pepper solution. The red pepper had the most vitamin C concentration. Because of the maturity of the red pepper, it contained the most vitamin C concentration.

Project Number: MCH008

Grade: 7

Title: Corrosion/Rust Resistance by Electroplating

Abstract: The purpose of this experiment is to observe how electroplating improves the corrosion resistance of an iron object. The procedure is to use vinegar and salt solution as medium, use copper rod as cathode and a nail as an anode. Dip both cathode and anode in salt solution and connect 12 volt battery to complete the circuit. This will deposit copper on the iron object. The quality of the plating will depend on exposed time, 2, 4, 8, 16, and 24 hours. The conclusion is that the more time that the nail is electroplated, the better the rust resistance.

Project Number: MCH009

Grade: 8

Title: AntAcid Temps.

Abstract: Purpose: To see if temperature affects effectiveness of ant-acids. Procedure: Freeze and Refrigerate 8 antacid tablets for one hour and four other tablets for 30 minutes. Microwave four tablets for 30 seconds and four for one minute. Drop each into replicated stomach acid and record results. Conclusion: The temperature did not affect the ant-acid's effectiveness.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH010

Grade: 8

Title: Comparison of Alcohols by Combustion and Water Produced

Abstract: The purpose of my experiment was to find if the amount of water that is produced by the combustion of different alcohols would vary. The procedures I used were combusted five different alcohols separately in a whoosh bottle and measured the amount of water that was produced by each one. Testing is still being conducted so no conclusion has been determined

Project Number: MCH011

Grade: 8

Title: What's in your Drink?

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

Project Number: MCH012

Grade: 7

Title: Bacteria in Your Toilet!

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

Project Number: MCH013

Grade: 8

Title: Shaken, Not Stirred

Abstract: I am trying to find out, when shaken, which pop fizzes out of the can the most? I will use a 12 mL can, kept at room temperature, and shake it five times. Next, I will pop the top of the can away from myself, and anyone else, letting the pop fizz until it is done. Finally, I will measure what is left in the can with a measuring cup, and log the amounts in my data book.

Project Number: MCH014

Grade: 8

Title: Stain Remover

Abstract: Purpose: Which detergent works the best. Procedure: Placed stains on pillow cases, allow time for drying (4 hours), wash with different soaps, Record data. Data: Mustard, coffee, hot sauce was removed while nail polish remained. Conclusion: Tide and Surf work the same.

Project Number: MCH015

Grade: 7

Title: Lead in Pencils Not Water

Abstract: My project was "Lead in Pencils Not in Water". For my project, I tested three different types of water purifiers, to see which one purified water the best. In the end, I found out that the under-sink filter worked the best in comparison to the pitcher filter and the faucet filter.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH016

Grade: 7

Title: pH Levels and Lead Testing

Abstract: Lead is a highly toxic element when exposed and used in many common household items. In recent news, manufacturers have been blamed for the high and dangerous amount of lead content in their products. Many concerned parents have felt the need to test the products they own themselves for lead content, but the Consumer Product Safety Commission feels many of these home lead test kits are unreliable. By testing which solution is best to use to leech the most lead, it can be determined if these test kits can be made more accurate for the use of the public based on professional lab testing.

Project Number: MCH017

Grade: 8

Title: How to Make it Work

Abstract: In this project I wanted to find which amount of salt could create the most electricity to light a bulb. My hypothesis was that the most amount of salt would produce the most electricity. In my procedures for all of the trials I took a bowl with water and different amounts of salt dissolved in it and soaked paper towels. I then placed the paper towels on a sheet of aluminum foil. After this I then placed activated charcoal on top of the paper towels. I then connected the light socket and the voltmeter and recorded data. In conclusion, my hypothesis was correct because I got the most volts of electricity from the first trial, which had the most amount of salt.

Project Number: MCH018

Grade: 7

Title: Which Antacid Dissolves and Neutralizes Best?

Abstract: The purpose of this experiment was to find what antacid will dissolve and neutralize in vinegar the best. The antacids tested were all name brands. Each antacid was placed in 100 mL beakers filled with vinegar. Chewable antacids tablets were crushed and liquid products were dissolved in water. A digital probe connected to a computer was used to record the pH level reached and the time of dissolution. Ten trials were conducted for each brand. My tests determined that Alka-Seltzer, or liquidized antacids, seem to dissolve and neutralize higher and faster than the other tablets.

Project Number: MCH019

Grade: 7

Title: Liquids Colorful Road

Abstract: My project is about what is the fastest ink color mover in different liquids. I used orange juice, soda, water, vinegar, soybean oil, and soy sauce. I colored black, blue and red dots on the filter paper, and dipped in the liquids for 35minutes. I did two experiments, experiment I using 2mm dots and experiment II using 5mm dots in diameter. The water was the fastest ink color mover in both experiments. And the blue and black inks were the fastest ink color changer in experiment I and II, respectively. My experiment may be used on the doping test.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH020

Grade: 8

Title: PLOP PLOP FIZZ FAST

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

Project Number: MCH021

Grade: 7

Title: Got Stink Bug?

Abstract: Which natural repellent will keep stink bugs away the best? First I combined each essential oil with one ounce of Witch Hazel. Then I dipped a cotton ball into the repellent. After, I dipped the cotton ball into the repellent. Then, I rubbed the cotton ball on a screen. Next, I place the screen into a container. Then, I close the lid. After I closed the lid I drilled holes on the lid. Finally, I observe the stink bugs to see if they are attracted to the smell or repelled to it.

Project Number: MCH022

Grade: 8

Title: Rust on Nail

Abstract: The purpose of my experiment is to see what protects a nail from rusting the best. Procedure: Nail 5 nails into a board. Coat them with a household oil (W-D 40, Marvels Mystery Oil, veg oil, motor oil,) then coat them with salt. Let them sit outside for 5 days check each day at 5 o'clock. record data. Data: Day 1- nothing rusted. Day 2- bare nail rusted most, W-D 40 didn't rust, veg oil, marvels, and motor oil rusted the same. Day 3- bare rusted the most, W-D 40 didn't rust, veg oil and motor oil rusted the same, and marvels rusted a little less than the bare. Day 4- bare rusted the most, veg oil, marvels, and motor oil rusted the same, W-D 40 didn't rust. Day 5- bare rusted the most, W-D 40 didn't rust, marvels rusted a little less than the bare, and veg oil and motor oil rusted the same. Conclusion -The bare nail rusted the most when W-D 40 didn't rust at all.

Project Number: MCH023

Grade: 7

Title: Spicy, Spicy, Spicy!

Abstract: What type of liquid gets rid of spicy taste that foods give you in your mouth faster? I had ten test subjects eat a variety of spicy items. Rate the spiciness of the item. Drink a liquid. Then rate the spiciness to see if the liquid diminished the spicy taste. Milk was the solution that had the best spicy reducing agent.

Project Number: MCH024

Grade: 8

Title: Emulsifiers

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

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH025

Grade: 8

Title: Analysis: Dental Whitening Products

Abstract: There are multiple ways to whiten teeth: over-the-counter whitening products are convenient, or professionally whitening can be done at a dentist's office. Professional products cost more, but they are thought to be superior to over-the-counter products. The purpose of this project was to find out which method is more effective. Eighteen teeth were cleaned, sterilized, and stained in coffee, tea, and blueberries. The stained teeth were compared to a shade guide and the shade was recorded accordingly. Three teeth were put in stone and marked as group one. That was repeated with the other teeth with a total of 6 groups with one coffee stained tooth, one tea stained tooth, and one blueberry stained tooth. Three of the groups were whitened with over-the-counter products and three groups were whitened with professional whiteners according to the directions. After the whitening, the whitened shade of the teeth was recorded. My testing found that Listerine Whitening Quick Dissolving Strips were the most effective. The research also shows that the products with hydrogen peroxide showed better results than the products with carbamide peroxide as the whitening agent, and were more cost effective.

Project Number: MCH026

Grade: 7

Title: It's A Wrap

Abstract: I am testing which type of plastic wrap prevents the development of mold on cheese and bread. Plastic wraps are made from three types of chemical compounds. I wrapped 10 pieces of American cheese and Italian bread with the three types of plastic wrap. Ten pieces of cheese and bread were left unwrapped as control groups. I made daily observations to see if mold was forming on the samples. These observations were recorded on data sheets. Observations will be made until mold has formed on each sample.

Project Number: MCH027

Grade: 7

Title: Never Go Dry

Abstract: The purpose of my science fair project was to find out what brand name lotion will keep the most moisture from evaporating. I tested Aveeno, St. Ives, Vaseline, Jergens, and CeraVe. My hypothesis was that I think Aveeno will keep the most moisture from evaporating. Aveeno contained oats, which coat the skin and prevents moisture from evaporating. I learned which key ingredients are the best to keep my skin healthy.

Project Number: MCH028

Grade: 7

Title: Differences between homeade,natural,and chemical cleaner.

Abstract: Testing different (surface) cleaners to see which has the best quality.

Project Number: MCH029

Grade: 8

Title: Effects of a Saltwater Solution on Metals

Abstract: The purpose of the experiment is to find out the effects of a salt solution on various metals. Copper, carbon steel, and galvanized steel were used for the experiment. Three holes

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

were drilled in a board. The metal samples were coiled and bent. The glasses were filled with 300 ml of water and one tablespoon of salt. The wire metal samples were placed in the solution and were stirred and observed daily. This experiment showed that copper corrodes so that it has no shine, but doesn't rust; carbon steel rusts very quickly and was 90 percent covered with rust, and galvanized steel corrodes over time in little black spots. In the end, copper was zero percent covered with rust, carbon steel was 90 percent, and galvanized steel was 30 percent covered with rust. The hypothesis was supported by the data. The magnetic samples corroded the quickest and the most. Therefore, salt water corrodes copper, rusts carbon steel quickly, and slightly rusts galvanized steel. Changes that would be made in further experimentation would be to test other metals such as cobalt or nickel.

Project Number: MCH030

Grade: 7

Title: Keeping It Clear

Abstract: The purpose of this experiment was to see if this method could be used in a crime scene investigation. To conduct this experiment, I used glasses at different temperatures and three human fingerprints. The experimental results were measured and the fingerprints were taken at 5 degrees Celsius, 25 degrees Celsius, and 45 degrees Celsius to see the differences in the levels of clearness. The results of the experiment showed that the prints obtained at 5 degrees are easiest to see. The results indicate my hypothesis should be rejected because the prints were most clear at cold temperatures, not warmer temperatures.

Project Number: MCH032

Grade: 7

Title: Fingerprint Patterns

Abstract: The purpose of this experiment is to detect whether fingerprint patterns are genetic. To conduct this experiment I took the subject's thumb and pressed the thumb lightly on the ink stamp pad. Then, I placed the subject's thumb on a 3 x 5 note card and put pressure on the subject's thumb. This transferred the fingerprint onto the note card labeled for each individual subject. The experimental results were measured by comparing the patterns of fingerprints. The results of the experiment showed that biological siblings have similar characteristics of fingerprint patterns. The results indicated that the hypothesis should be accepted because biological siblings have similar characteristics of fingerprint patterns.

Project Number: MCH033

Grade: 8

Title: Dissolving Speed!

Abstract: My project, Dissolving Speed!, answers the question: Does temperature affect the rate at which a solute dissolves in water. I hypothesized that hotter water will dissolve the solute quicker. I chose this experiment because I was puzzled how sugar dissolves instantly in coffee compared to the slow process in a cold beverage. For the experiment I used a 1000ml beaker full of water of varying temperatures and poured in the sugar and salt one by one. My hypothesis was proven correct hotter water dissolved both the sugar and the salt faster.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH034

Grade: 8

Title: Durability of Paint

Abstract: Knowing the most durable paint might help you save money in your future. In this experiment, I used Behr: Oil Based and Latex, Rust-Oleum: Oil Based and Latex, and Glidden: Oil Based and Latex paints. I painted thirty 12.7 cm sq. boards with primer, let dry, and then paints were applied in exactly the same way and amount. I put them in three groups: A, B, and C. Group A went to a heating unit, Group B went to the freezer, and Group C went into Acid Rain for 15 trials lasting 1 day each. Boards were examined using a 100 block grid to determine the exact amount of chipping, and results were recorded. Rust-Oleum Oil Based paint performed the best, due to the formula of the oil based paint.

Project Number: MCH035

Grade: 8

Title: The Mysteries of Mummification

Abstract: This experiment mimicked the mummification process of the Ancient Egyptians to determine if an apple or Cornish hen submerged in Natron solution would have moisture removed faster. This experiment compared an apple and Cornish hen submerged in Natron solution over eighteen days. Moisture levels were compared using a relative scale and properties of color, size, hardness, and odor were also compared. The results showed that the Natron solution absorbed moisture from the apple faster than the Cornish hen. The results indicate that my hypothesis should be accepted. The Natron solution absorbed the moisture faster from the apple than the hen.

Project Number: MCH036

Grade: 8

Title: Captain Fluoride

Abstract: The problem of my experiment is, "Does fluoride protect our teeth from sugars?" Before I did my experiment I hypothesized that the fluoride will make your teeth stronger and fight cavities. In my procedures, I painted an egg with fluoride then filled two beakers with the same sugar drinks and submerged the fluoride and the plain egg into one of each beaker. Checked the status of the eggshell every 24 hours and recorded the findings and did the process for every drink. The Koolaid, Gatorade, and apple juice had the most cracks for the plain eggs.

Project Number: MCH037

Grade: 7

Title: Solar vs Battery

Abstract: I conducted this experiment to find whether solar panels or batteries convert energy more efficiently. My hypothesis is that batteries convert energy more efficiently, because they generate energy inside of them and output it into the LED bulb. I made a simple circuit and measured the brightness and the voltage with a brightness meter and a voltage meter. After testing the brightness and the voltage for twenty consecutive days, I have concluded that batteries convert energy into light more efficiently than solar panels. It is imperative to find a good way to get energy while being environmentally friendly.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH038

Grade: 7

Title: Best Burning Wood

Abstract: The purpose of my experiment is to determine if the species of wood affects that rate at which it burns. The procedure will include burning four types of wood, i.e. maple, oak, ash, and pine. All the woods will be comparatively the same size and shape. I will burn each type, one at a time, noting the factors that affect it such as the density of the wood by weight, the intensity of the heat and the weather conditions. No data is yet available. The conclusion would be that the hardwoods such as oak and maple will burn longer and hotter.

Project Number: MCH039

Grade: 8

Title: Goodness Gracious-All That Gluten

Abstract: My experiment is to see which type of flour has most gluten. Gluten flour will contain the most gluten. I measured one cup of flour into each bowl. I mixed in half cup of water in each. I mixed each dough ball together forming a ball. I let the ball of dough sit for ten minutes. I wrapped the ball in cheese cloth. I put the ball of dough under the faucet in the sink and ran the water and waited until all the milky water came out. I timed this step. When the ball was done letting milky water come out. I recorded the time.

Project Number: MCH040

Grade: 8

Title: Electrolytes in Drinks

Abstract: The purpose was to determine whether orange juice or sports drinks contain more electrolytes. A conductance sensor was constructed. The sensor was placed in each drink to determine the amount of electric current: the higher the reading for electric current, the more electrolytes in the drink. The readings for electric current were measured and recorded. The data was displayed in a data table and bar graph. The orange juice displayed the most electric current and, thus, the most electrolytes because orange juice contains citric acid and sport drinks do not.

Project Number: MCH041

Grade: 7

Title: Candles: Gel, Soy, or Wax

Abstract: What type of candle lasts the longest. Assemble candles in three groups of five. On a burning tray, place one of each type of candle. Light each candle with a match at the same time. Note the time that each candle was lit. Write this down. As each candle burns out, record the time in the data book. Repeat steps five times and record the burn times. Graph the results. After collecting all of the data, the gel candles should last the longest. This is followed by the wax, then the soy.

Project Number: MCH042

Grade: 8

Title: Crunchy Carrots

Abstract: The purpose of my project is to determine if carrots stay fresher if they are blanched before they get frozen. For my procedure I will get four groups of peeled carrots. I will put two groups in the freezer and I will blanch the other two groups. Then I will also put them in the

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

freezer. After one and a half weeks, I will check all of the groups for color, texture, and toughness. I think the ones that went right into the freezer will be more fresh because they're not getting heated before they are frozen. I found out that the blanched ones stayed more fresh. Than the group I put straight into the freezer. My future idea would be testing different types of vegetables.

Project Number: MCH043

Grade: 8

Title: Crystal Growth in Different Temperatures

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

Project Number: MCH044

Grade: 8

Title: Water Density

Abstract: The purpose of this experiment was to determine whether salt water is denser than pure water. The procedure for making a hydrometer consists of cutting a straw to 4 inches. Then plug one end of the straw with clay and put it in to a cup of water filled 3/4 the way. Once that is done, drop one BB at a time into the straw until it is standing straight up in the water. When it stands, mark the straw at the water level with 1.0, the mark 1 cm apart, going toward the clay end. mark these 1.1, 1.2, 1.3 and so on. Repeat the last step but marking above the 1.0 mark and marking those 0.9, .08, 0.7 and so on. When that is finished, measure the water with no salt first and record that measurement. Add 1 tsp. of salt each time. And then record that. Do 4 tests exactly the same way as the first. You can do cup A with pure water all the way to E with 5 tsp. of salt. Record all the measurements then average them. The average for Test A was 1.11, for Test B 1.11, Test C 1.1075, and for Test e 1.0425. The conclusion was that salt water is denser than pure water.

Project Number: MCH045

Grade: 7

Title: Temperature vs. Glo Sticks

Abstract: The purpose of this experiment was to find how temperature affects glow sticks. The time and brightness were compared between 20 glow sticks in 250mL of water. The glow sticks were divided into 5 different cups of water that had different temperatures. To measure the brightness and time, I timed the glow sticks and recorded the brightness every 5 hours on a 1-10 scale. The results of the experiment showed that the glow sticks glowed the brightest in the hottest water and lasted the longest in the cold water. The results show that my hypothesis should be accepted.

Project Number: MCH046

Grade: 8

Title: HHO fuel cell

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

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH047

Grade: 8

Title: Do You C What I C?

Abstract: In order to begin this project, I purchased 7 different types of orange juice and 2 frozen concentrates. Then, I will use the process of titration to determine how much Vitamin C is in each product. A Standard Solution will be made to determine how much Vitamin C there is in a 500 mg Vitamin C tablet. Once this process is finished, I will record and analyze the results.

Project Number: MCH048

Grade: 8

Title: Which Strawberry Gum Flavoring Lasts Longer

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

Project Number: MCH049

Grade: 8

Title: Light the Pickle

Abstract: Cut end of cord off. (not the end you plug in.), strip wire exposing about one inch of bare wire. Punch a hole on each end of the pickle using a nail approximately size of wire. Insert the stripped wire in each hole. If able take experiment outside. Take care in making sure pickle can lay in an area where you don't come in contact touch while it is plugged in. plug in and time. Until it catches on fire. 13 min 30sec glowing and sparking sporadically 15 min. Dill pickles lights up sweet pickles blows up.

Project Number: MCH050

Grade: 8

Title: Evaporating H₂O

Abstract: Purpose: To see if fresh water evaporates faster than salt water. Procedure: Fill one beaker with 50ml of fresh water. Fill one beaker with 50ml salt water. Maintain beakers at room temperature. Record observations. Data: 1ml of evaporation per day for each beaker. Conclusion: presence of salt does not determine rate of evaporation

Project Number: MCH051

Grade: 8

Title: What is the most effective way of removing oil?

Abstract: The purpose of this experiment is to find what material best absorbs oil. Submerge sixteen cubic centimeters of absorbent wrapped in cheesecloth in 100 milliliters of oil in a graduated cylinder for one minute. Remove the absorbent and measure the amount of oil remaining in the cylinder. Repeat ten times for each absorbent: peat moss, crystalline silica, pet hair, cellulose, and cat litter, and empty cheesecloth. Peat moss absorbed the most oil overall and crystalline silica least. Pet hair did best by weight and cat litter worst. The data supported the hypothesis that peat moss would absorb the most oil.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH052

Grade: 7

Title: Flame Wizard

Abstract: The effects of type and amount of an element on the color of a flame were tested. The hypothesis was that an element can be identified based the color observed. 0.2 g and 0.5 g each of sixteen materials were tested in a flame produced by burning methanol. The observed colors ranged from violet to candy apple red. The color depended on the type but not on the quantity of material tested. Some materials did not produce an observable color. The color of the flame did not uniquely identify the element but the spectral lines observed in a spectroscope did.

Project Number: MCH053

Grade: 7

Title: Are your suds duds

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

Project Number: MCH054

Grade: 7

Title: Serious Stain Problems

Abstract: After research I believe that Tide with Oxiclean will take out all of the stains the best. First I stained the clothes with ketchup, oil, and ink. My next load was washed with just Tide. The final two loads of laundry were washed with Tide mixed with Oxiclean and then Tide mixed with bleach. I recorded the results. Tide with Oxiclean worked the best on all three of the stains. Plain tide worked the second best. Tide alone worked the third best, and finally water as my control test worked the worst.

Project Number: MCH055

Grade: 7

Title: Plop,Plop, Fizz, Fizz, What A Race It Is!

Abstract: Alka-Seltzer® is a great medicine for headaches and upset stomachs. This experiment is intended to question whether the temperature of the water or the form of the tablet will affect the speed of the reaction of the tablet. Broken and crushed tablets were dissolved in 5°C and 30°C water. The speed of the reaction was measured by the amount of ccs of CO₂ given off per second. The results determined that the crushed samples in the 30°C water reacted the fastest. This conclusion that reactions with warmer water and smaller particle size react the fastest.

Project Number: MCH056

Grade: 7

Title: Finished

Abstract: My experiment is called FINISHED. My experiment is which drink takes the finish off of the wood the best. I hypothesized that the Coke would take it off the best because some people use it to clean car engines. When I was doing my experiment I noticed that after 24 hours of letting the liquids dry they got sticky. After the wood had dried I wiped it off and to my surprise nothing happened to the wood. My conclusion was that none of the dinks had an effect.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH057

Grade: 8

Title: Plop Fizz

Abstract: The purpose of this experiment was to observe the reaction of a mixture of alka seltzer at different temperatures of tap water. The procedure is to put 250mL of 40 degrees Celsius hot tap water, 15 degrees Celsius cold tap water, and 2 degrees Celsius ice tap water. Do six trials for each temperature. Use the same glass for each trial. Start the stopwatch as soon as the alka seltzer tablet is dropped in the water. Stop the stopwatch after the solid material has dissolved and the carbon dioxide bubbles have stopped forming. Record the time and calculate the average. The average reaction time for the hot tap water was 27.23 seconds, the cold tap waters average reaction time was 72.45 seconds and the ice tap waters average reaction time was 150.38 seconds. The conclusion was that the hot tap water dissolves the alka seltzer because it breaks the molecules down faster. The hot tap water also dissolved the alka seltzer faster because it has more energy than the other two water temperatures and it transfers that energy to the alka seltzers molecules which breaks it down faster as well.

Project Number: MCH058

Grade: 7

Title: Squeeze Me

Abstract: I made an iodine solution and tested three different types of liquids. The hypothesis was proven incorrect. The Vitamin C tablet contained more Vitamin C than the store brought and freshly squeezed orange juice. The store brought orange juice contained more Vitamin C than freshly squeezed orange juice.

Project Number: MCH059

Grade: 7

Title: A Rusty Situation

Abstract: In my project I tested whether nails would rust faster in salt water, tap water, vinegar or sprite. I got four containers and put two nails in each container. I watched for ten days, and wrote the results in my data book. When I asked people which liquid they thought would rust the nails the fastest, most of them said either salt water or vinegar. That is what I based my charts and graphs on. On day ten I wrote down the final results, tap water had rusted the nails completely and the fastest.

Project Number: MCH060

Grade: 7

Title: Rainbow Explosion

Abstract: I was interested to see how different kinds of dish soap would spread color in milk. I used three different dish soaps, plates, milk, food coloring, and craft sticks to do my experiment. I put several drops of food coloring in the milk poured into the plates. I used the craft stick to dip into the soap and cause a reaction. I found that the Dawn dish soap did the best job of spreading the fat in the milk, by observing how quickly the colors spread across the plate.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH061

Grade: 7

Title: The Better Insulator

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

Project Number: MCH062

Grade: 7

Title: Which Form of Pain Medication Dissolves Faster?

Abstract: Various forms of a typical over the counter pain medication were each evaluated to determine which medication would dissolve at the greatest rate. In addition, acidic solutions were also evaluated to better model the action of stomach acid on the medication.

Project Number: MCH063

Grade: 8

Title: A Fizzy Situation!

Abstract: I will be determining what temperature does the carbon dioxide in pop decrease at the most amount. The reason behind doing my experiment is that when I did research on the internet, people who have done this project before came up with various answers. I wanted to find out the truth. When first doing this experiment, I will buy Coca Cola soda. Subject the Coke to different temperatures. Shake it. Allow CO₂ to escape by releasing the cap. Weigh the Coke again. Record the amount of end weight. Compare my results. The Coke that was at the warmest temperature lost the most CO₂.

Project Number: MCH064

Grade: 8

Title: The Effect of Precipitation on the pH of Big Sewickley Creek's Water

Abstract: The purpose is to see how acid rain affects the environment. I selected this topic because I am concerned about the environment. I hope to prove that Big Sewickley Creek is not polluted. For my procedure, I drove up to the location and walked up to the creek. Then, I took a cup filled with the water. Afterward, I stuck a pH strip into the sample. My data shows my variables have a pH of 6. My control has a pH of 7. My hypothesis slightly differed from my results. I am happy that the creek is only slightly acidic.

Project Number: MCH065

Grade: 8

Title: Orange You Glad I Told You?

Abstract: The purpose of this experiment was to inform people how much and how fast Vitamin C is lost when put under different conditions. To conduct this experiment, I needed to know what I would be measuring. I needed 20 jars of 100 milliliters of orange juice, Vitamin C test strips, and a stop watch. These experimental results were measured by Vitamin C test strips. The results of this experiment were the jars I put in the refrigerator that were closed and shaken were the ones that kept their Vitamin C the longest. This proves my hypothesis was correct.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH066

Grade: 8

Title: Comparison of pH Levels in Sodas

Abstract: The purpose was to determine which soda is the most acidic. The pH of the following sodas, Coke, Pepsi, Mountain Dew, and Barq's Root Beer, were measured with a pH meter. The data was displayed in a data table and bar graph. Barq's Root Beer had the highest pH reading, and was, thus, the least acidic. Both Pepsi and Coke had the lowest pH reading and were, thus, the most acidic. Root beer contains only citric acid while Pepsi and Coke contain both phosphoric and citric acids.

Project Number: MCH067

Grade: 8

Title: Pit of Rocks

Abstract: The purpose of this experiment was to see which rock has a higher pH - coal or siltstone, and how rocks can affect water systems? It was predicted that siltstone would be more basic and coal more acidic, and that they would each affect the water system accordingly. Rocks were equally separated into distilled water and placed into a tumbler machine. Each type of rock was crushed separately prohibiting cross-contamination. The pH of the water was measured daily and analyzed over time. Hydrologists and Environmentalists would be interested in the results of this experiment.

Project Number: MCH068

Grade: 7

Title: Popped Tooth

Abstract: Which soda will decay teeth the most? False teeth were obtained from a certified dentist and placed individually in 5 different types of soda for several weeks. It was hypothesized that Mt. Dew would cause the greater decay because of its level of sugar content, however the data proved the hypothesis incorrect. Root Beer actually showed the greater decay.

Project Number: MCH069

Grade: 7

Title: What is the Most Efficient De-icer?

Abstract: I am doing an experiment to test what is the most efficient deicer. The experiment's purpose is to find which deicer: Prevents ice formation, melts ice the fastest, costs very cheap, can lower the temperature at which the ice melts to a temperature which is suitable for winter conditions, has the least amount of environmental damage, and does the least amount of damage to driveway and concrete surfaces. In the experiment, each deicer will go on a pan and water will be added. Then, the pans will be put in freezing temperatures to see which deicer prevents ice formation the best. Also, each deicer will be put on frozen blocks of ice to see which deicer melts ice the fastest. Research will be done to see which deicer has the least impact on the environment and does the least damage to roads. This will not be testable because of the limited time frame for the experiment. This experiment has many real world applications for the general public, transportation companies, airports, and even the military. In Pittsburg, we generally receive respective amounts of snow during the winter season. Just last year, we received a record of over 68 inches of snow. If the roads, driveways, and airports weren't deiced with the best deicers, that could cost unnecessary money and environmental damage. This experiment will be very interesting to conduct and will yield many useful results for everyone.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH070

Grade: 8

Title: Melting Butter

Abstract: My question was which butter will melt most quickly in a stainless steel pan? Out of corn oil margarine, olive oil margarine, and pure butter, I hypothesized that pure butter would melt in the least amount of time. I heated the pan on 6 for 1 minute, and placed the butter into it. Then, I timed how long it took for the stick of butter to fully melt, and recorded my data. The pure butter took the least amount of time to melt, followed by the olive oil margarine and lastly, the corn oil margarine. Therefore, my hypothesis was correct.

Project Number: MCH071

Grade: 8

Title: Which Type Of Ice Melter Works the Best and Is the Most Cost Efficient?

Abstract: The way I conducted my experiment was first I froze my ice for two days then I took a half a cup of each of my types of materials and put them on my different blocks of ice. Then I waited an hour to make my observations. I used in my experiment calcium chloride, rock salt, and solar salt. My hypothesis was correct calcium chloride did in fact work the best.

Project Number: MCH072

Grade: 8

Title: Comparing the Mummification Process

Abstract: Proper mummification requires a superior desiccant. This investigation determined which of the desiccants tested removed the most liquid from a "mummy". This researcher used a hot dog for a "mummy". Five different desiccants (salt, sand, baking soda, sawdust, baking soda and salt) and a control were tested. Data collected over 10 days included color, weight, and percentage of liquid removed. Data collected thus far shows that sawdust and baking soda with salt removed the most liquid. Further analysis of data may show additional results.

Project Number: MCH073

Grade: 7

Title: Caution: Wet Paint, Don't Touch!

Abstract: Does the amount of pigments in a can of paint affect its drying time? I will take a wooden board and glue four clear plastic dishes to each board. I will then add paint to each dish using a dropper. After one hour, I will drop a cotton ball on each dish and leave the cotton balls on there for 10 seconds. Then, holding the edge of the wooden board, I will gently tip the board causing the cotton balls to fall off at the same time. I will then take a picture of each cotton ball. I will repeat this step ten times, testing four dishes with different amount of pigments at a time. I will use a magnifying glass to observe the residue on the cotton balls. I will also use a magnifying glass to see if there are any cotton ball strings left on the paint dishes. I will record my data and make a graph. I think the paint with the least amount of pigments will dry the fastest.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH074

Grade: 7

Title: Corroding Nails

Abstract: In this experiment, I am going to test which type of nail will corrode the fastest. The three types of nails are; steel, aluminum, and copper. Corrosion is a problem for people and industry. Scientists and laboratories look for ways to stop corrosion.

Project Number: MCH075

Grade: 7

Title: Battery Storage Methods

Abstract: This experiment was designed to determine which storage strategy would extend the life of a battery the most, so that battery buyers could save money. I believed that storing batteries in room temperature in a plastic bag would extend their life the most. To achieve this goal, I stored the 36 batteries in several conditions for 30 days- in a refrigerator, in a freezer, and at room temperature- both in plastic bags and without bags. I took them out and tested them in flashlights to see which batteries would last the longest. This was repeated three times. The batteries kept in a plastic bag in room temperature lasted the longest in all three trials.

Project Number: MCH076

Grade: 8

Title: Apples to Apples

Abstract: The purpose of my project is to see what apple has the least effect on diabetics. The procedures used in my experiment are: 1 Give subject an apple. 2. Record blood sugar levels every half hour for an hour and a half. 3. Repeat daily with different apples. 4. Get average. 5. Get conclusion.

Project Number: MCH077

Grade: 8

Title: There's Crayon On The Wall

Abstract: In any cleaning product, the molecules can either be classified by polar or non-polar. Polarity is the tendency of a molecule, to be attracted or repelled by electrical charges because of an asymmetrical arrangement of electrons around the nucleus. A polar molecule is a type of covalent bond in which the electrons are shared. A non-polar molecule has no separation of charge, so no positive or negative poles are formed. Polar molecules dissolve other polar molecules, and non-polar molecules dissolve other nonpolar molecules. The Periodic Table can be used to determine if a molecule is polar or non-polar. With this information, one can forecast which cleaning product will remove a specific material, in this case, crayon off drywall. A crayon is a stick of colored wax, charcoal, chalk, or other materials used for writing, coloring, and drawing. The small electronegativity differences in the hydrogen chains in the wax molecules cause a crayon to be non-polar, which means non-polar cleaning products will most likely remove crayon the best.

Project Number: MCH078

Grade: 8

Title: Heating and Freezing an Onion

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

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH079

Grade: 7

Title: Let It Glow!

Abstract: Let It Glow. Investigate whether warmth or coldness would affect the brightness of a glow stick. Prepare materials. Prepare 5 cups of water at the temp of 107.5. Place 1 cracked glow stick in each of the 5 cups. Wait 15 minutes. Remove each glow stick carefully in the same manner. Record observed data. Repeat above steps 4 times with gradual temperature decrease. Note for each of the 5 test stages the impact of temperatures on light intensity. Glow sticks with higher temperature didn't go out, while glow stick with lower temperature went out faster.

Project Number: MCH080

Grade: 8

Title: The Effects of Hydrogen Peroxide

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

Project Number: MCH081

Grade: 7

Title: What Type of Cleaner Will take out Permanent Marker the Best

Abstract: In my project I'm trying to see what type of cleaner will take out permanent marker the best. I'm putting a shirt in a container for 30 min and seeing which one will take out the permanent marker. I'm doing three trials of this.

Project Number: MCH082

Grade: 8

Title: Freezing Milk

Abstract: The purpose of science experiment is to determine which type of milk freezes the fastest. I filled 4 containers with 4 different types of milk: light cream milk, skim milk, whole milk, and half & half. I put 1 cup of each milk in each container and I put them in the freezer. I started at 5:30 and I checked on them every 15 minutes. I checked to see which one was freezing the fastest. Also I was very accurate with my recording and my data. All of the milks froze at the same time except the skim milk, Skim milk took the longest to freeze. In conclusion, I think the amount of fat does not affect the way it freezes.

Project Number: MCH083

Grade: 7

Title: It Makes Scents

Abstract: My project is to test the enfleurage extraction technique. This technique uses wax or fat to extract the oils from rose petals and test the scents of the extracted oils in the Crisco over different length of time. Using foil covered cardboard square covered with Crisco then chopped rose petals, I created "sandwiches" and put them under pressure. Removing the sandwiches after a few days, use a double boiler to melt the Crisco and rose petal mixture. Ethyl alcohol is mixed in a glass jar with the melted the strained Crisco to cure. After a few days in a dark room, I dipped sketchbook paper into the solution for subjects to smell the scents.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH084

Grade: 7

Title: Would you Like Your Apples Brown, Sir?

Abstract: The purpose of my experiment **Titled** "Would You Like Your Apples Brown, Sir?" was to learn about the oxidation of apples when cut open. I also wanted to know which common household ingredients would best prevent this process. To test this question, I cut five apples into equal slices. Each set of slices was coated with a specific ingredient and set on a different labeled plate under direct light. The ingredients were sugar, salt, honey, and lemon juice. The last plate of apple slices was left alone. I hypothesized that lemon juice would best keep the apples from turning brown based on some research that I did. I found that there are enzymes stored in the cells of apples. When apples are exposed to oxygen, the cells split apart and release the enzymes. An enzyme is a type of protein that speeds up chemical reactions in living things. These enzymes speed up the browning of apples. However, the acid in lemon juice works to "kill" enzymes. Without the enzymes, the apples won't turn brown as fast. I observed my plates of apple slices every hour over the course of one day (12 hours). I recorded all data I observed.

Project Number: MCH085

Grade: 8

Title: Survival of the Fittest

Abstract: My purpose is to find out what kind of fruit rots quicker, organic or inorganic fruit. Procedures are to set up fruit in an area, then record results on a daily basis in data book. Data: pears seem to rot quicker and apples seem to last longer. Oranges remained the same and bananas developed brown spots on the peel. Conclusion: It seems that organic fruit lasts longer than inorganic fruit.

Project Number: MCH086

Grade: 8

Title: Which type of salt comp. is the most effective for melting ice?

Abstract: The purpose of this experiment was to determine which common salt compound melts ice most effectively. The procedures for this experiment I performed included adding a known mass of a single salt compound to a known mass of ice at two different air temperatures. The degree of melting at each temperature was measured over time. This procedure was repeated for two additional salt compounds at the two air temperatures. Research is still being conducted. Final **Abstract** will be available at my exhibit on Fair Day.

Project Number: MCH087

Grade: 8

Title: Sweeteners and Viscosity

Abstract: The purpose was to determine which sweetener (aspartame, sucralose, saccharine, sugar, raw sugar) when mixed with water has the greatest viscosity. Sugars were dissolved in water and permitted to drip through a hole in a can. The amounts of time in seconds for each solution to completely drip were measured and recorded. The solution that took the longest to drip had the greatest viscosity. The data was displayed in a data table and bar graph. Raw sugar took the longest time and, thus, has the greatest viscosity because raw sugar has the highest molasses content.

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH088

Grade: 8

Title: Chemical Chill

Abstract: My report was if weather could affect a chemical reaction. I started by measuring the temperature of each day I did the experiment. After I had the temperature I took the 222ml of coke and put a mento inside it. I repeated this process each day that I did the experiment. I also took 225ml of vinegar and put 5ml of baking soda in it. I recorded the results on both experiments. The result of this experiment was the higher the temperature the shorter the vinegar and baking soda reaction fizzed. So weather does affect chemical reactions.

Project Number: MCH089

Grade: 8

Title: How Corrosive Are Soft Drinks?

Abstract: The purpose of my experiment was to see how corrosive are soft drinks. The procedures that I used was 6 baby jars, tighten the lids on the jars, diet Pepsi, Pepsi, coke, diet coke, sprite, diet sprite, iron metal filings, gauze pads, strainer, gram scale. My data was that all the diets were more corrosive than regular soft drinks. My conclusion is that at the end of my experiment is that the diets were more corrosive the leader in the diets was diet Pepsi brand that's my conclusion.

Project Number: MCH090

Grade: 8

Title: Which color of M&Ms have the dye(s) with the highest Rf value?

Abstract: M&M's come in many colors. I wanted to know what dyes made up the vibrant colors and how concentrated they were. I tested the original colors of M&M's and learned what dyes make up the bright colors we can easily recognize. Through Paper Chromatography I used rubbing alcohol as a solvent that caused the dyes to spread out on paper. I learned the dyes in the brown coating travel the farthest, going along with my theory that the darker colors have higher concentrations. Further testing can determine if this is true for most dark colored M&M's

Project Number: MCH091

Grade: 7

Title: Candle Hardness and Burning Time

Abstract: The purpose was to determine if the hardness of the candle wax affects the burning time of the candle. Candles were made using different amounts of wax hardener. These candles were lit and burned. The time until each candle was completely burned was measured and recorded. The data was displayed in a data table and bar graph. The candles with the most hardener added burned the longest. Since the candles were harder, they did not melt as fast.

Project Number: MCH092

Grade: 8

Title: Big Things Poppin'

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

CHEMISTRY - INTERMEDIATE (7TH-8TH GRADE) - MCH

Project Number: MCH093

Grade: 8

Title: To Infinity and Beyond

Abstract: My project is on what is the correct ratio of baking soda to vinegar that will result in the highest launch of a homemade rocket. I made three rockets and filled them with different amounts of vinegar and baking soda to find out which ratio made the rocket launch the highest. The results were measured by calculating the angle of the rocket at its highest point. The results were that less baking soda and more vinegar resulted in the highest launch the ratio was 21.3 to 1. My hypothesis is not accepted. I predicted the 1 to 1 ratio would go the highest.

Project Number: MCH094

Grade: 7

Title: Particle Size vs. Reaction Rate

Abstract: The purpose of my experiment was to test the effects of particle size on reaction speed using Alka Seltzer and water. I dropped the whole, half, and powdered whole and half tablets into 17mL room temperature water in a film canister and timed how long it took for the cap to pop off. The average times were: whole tablet-9.39 seconds, powder whole tablet-2.12 seconds, half tablet-15.86 seconds, and powder half tablet-3.76 seconds. My conclusion is that a larger surface area will have a faster reaction.

Project Number: MCH095

Grade: 7

Title: How Permanent are Permanent Markers?

Abstract: In my experiment I wanted to know which product will remove permanent marker stains off a white shirt. I drew 6 dark purple squares and 6 light purple squares to see if there's a difference. The squares were 2 inches. The toothpaste worked best because it made the stain lighter, the nail polish remover also worked well but smeared the stain. However, the sunscreen had the opposite effect and made the darker purple stain much darker. The lighter squares were easier to remove than the darker squares. All of the products worked but none of them removed the stain entirely

Project Number: MCH096

Grade: 8

Title: From Leaf to Leached

Abstract: Leaching is an important topic among engineers because it can lead to dangerous outcomes, such as rain passing through toxic materials in the ground. My goal is to find the ideal amount of time and the ideal temperature to leach the tea leaves into the tea and to study the chemical reaction that occurs. First, I will heat a pan with water, tea leaves, and a thermometer. I will use a hydrometer to measure specific gravity of the liquid until it is 50% denser than water. Ongoing experimentation will show the perfect time and temperature for the leaching process.

COMPUTER SCIENCE / MATH - INTERMEDIATE (7TH-8TH GRADE) - MCM

Project Number: MCM001

Grade: 7

Title: Dissolve Rates for Advil Types

Abstract: The purpose of this experiment was to test which type of Advil dissolves fastest; tablets, caplets, or gel caplets. To conduct the experiment place an Advil in 100 mL of water heated to 37.9 C, turn on a stirring machine to stir the water, and start a timer. Test each type 11 times. Once the pill dissolved the time was recorded and the pH measured. Results showed the caplets dissolved fastest and all three had around the same pH. Tablets dissolved the slowest, and gel caps were in the middle. Caplets will provide the quickest relief when taken.

Project Number: MCM002

Grade: 7

Title: Probability and Game Theory of the Diseased Cow Trebuchet

Abstract: Given a imaginary game scenario of the attacking sentient trebuchet using diseased cattle as ammunition firing on a castle inhabited by 1000 killer rabbits. The castle is divided into four quadrants, each quadrant containing a 10 x 10 grid. Rolling dice will determine which grid square is struck and how much population damage is accomplished.

Project Number: MCM003

Grade: 8

Title: Mistaken Identity

Abstract: In my project I am seeing if sequential lineup or simultaneous lineup is more accurate. I am doing this because I am interested in being a detective when I get older. I decided to research different studies where there was each type of line-up and analyze the results to determine which was more accurate. I hope to be able to determine which type of line-up is more accurate and also I want to see if there are other factors that influence the accuracy.

Project Number: MCM004

Grade: 8

Title: The Golden Ratio

Abstract: The purpose of this experiment was to see if objects that contain the Golden Ratio appear to be more appealing to the eye then other objects that do not contain the Golden Ratio? It was predicted that the golden ratio, when present, will be more beautiful compared to another picture that does not contain the golden ratio. Mathematicians, Engineers, and Consumer Scientists would be interested in the results of this experiment.

Project Number: MCM005

Grade: 8

Title: Homemade Cipher

Abstract: The purpose of my project was to create a homemade data encryption device which someone could use to see the basics of data encryption. I first learned JavaScript and HTML, then I typed out the program using Notepad++. At the end of the project I now have a website with an encryption device which people can use to understand the basics of encryption. I decided to do this project because of my interest in computer science but also because in today's high-tech society it is becoming more important to keep data safe from hackers.

COMPUTER SCIENCE / MATH - INTERMEDIATE (7TH-8TH GRADE) - MCM

Project Number: MCM006

Grade: 8

Title: Sorting Algorithms

Abstract: The purpose of my experiment was to find out if different amounts of numbers effected how quickly sorting algorithms sorted them. My procedures were, create sorting 4 sorting algorithms, merge sort, insertion sort, selection sort, and bubble sort. Next, I created randomized lists for 100, 250, 500, 750, 1000, 2500, 5000, 7500, and 10000 numbers. After that, I ran the algorithms with each list in nanoseconds and milliseconds. My data showed that Merge Sort was most efficient. In conclusion, Merge Sort was most efficient, followed by Selection Sort, then Insertion Sort, and finally Bubble Sort.

Project Number: MCM007

Grade: 8

Title: Does El Nino Foreshadow Higher Rain Totals in Pennsylvania?

Abstract: Pennsylvania precipitation data from "El Nino" and "non-El Nino years" years was collected and tabulated. Histograms and other mathematical evaluation tools were used to assess the impact of El Nino on precipitation totals for Pennsylvania.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS001

Grade: 7

Title: Which juice cleans pennies the best?

Abstract: My purpose of doing this project is to figure out which juice cleans pennies the best. I use the 2 bowls to put juice in one and hot water in the other. I got the pennies and dropped it in the hot water and then took it out so I will put it in the juice. Then I wait 2 days for it to take out the dirt from the pennies then I take it out. In my conclusion I predicted that soda would clean the pennies the best because it has a lot of caffeine and acid

Project Number: MCS002

Grade: 7

Title: Which lubricant works best on model roller coasters?

Abstract: The purpose of the investigator's research was to determine which lubricant propelled cars the farthest along a model roller coaster track. The investigator built a K'Nex test track and tested four different lubricants to see which lubricant allowed the car to travel the farthest. After repeated tests, the investigator determined that the silicone spray helped propel the car the farthest.

Project Number: MCS003

Grade: 8

Title: The Effect of Beverages on Invisalign Tooth Aligners

Abstract: The purpose of my experiment was to determine if beverages stain Invisalign Tooth Aligners as the orthodontist warned that they may stain. I soaked pieces of aligners in five different beverages for twenty minutes, recorded the color of the stain, rinsed them and recorded the color again. I used an L value system to determine the amount of coating on the aligners before and after I rinsed them. I noted that, before rinsing, the Gatorade had tinted the aligners the most. However, I concluded that Invisalign are not easily stained, as all the aligners had rinsed clear.

Project Number: MCS004

Grade: 7

Title: Urgent for the Best Detergent

Abstract: Identical cotton shirts were subjected to a variety of stains. Each shirt was then laundered using a different detergent to evaluate which detergent removed stains to the greatest extent. Stain removal was evaluated on a scale of 1 to 5.

Project Number: MCS005

Grade: 8

Title: What Is The Healthiest Movie Snack?

Abstract: With so much attention on preventing childhood obesity I thought it was a good idea to see what kids should order at their regular trips to the movie theatre. By making healthy choices this can affect our health directly. Many people go to the movies regularly and snack while they're there. There are a lot of choices, but it is unclear which ones are worse for us than others. For this experiment I went to a movie theatre and recorded the menu selections that interested me. Many treats such as M&M's, Hershey's Chocolate Bar, Junior Mints, etc., are very popular at theatres. For my project, I calculated the calories, sugar, fat, and saturated fat for each snack considering that I thought that those four components affected the weight

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

and health of the body. Many people, including myself, expected any type of popcorn to be the healthiest because it does not contain much sugar. I thought chocolate candy would be the worst because it is processed and contains a lot of sugar. It was surprising to find that Strawberry Twizzlers and Sour Patch Kids Candy are the best things to order at the movies, while large, buttered popcorn is the worst. The butter added to the popcorn made a significant difference in calories, fat, and saturated fat. Next time you go to the movies make sure you order Twizzlers or Sour Patch Kids!

Project Number: MCS006

Grade: 8

Title: Luminosity

Abstract: My project "Lumosity" answers the questions of whether or not compact fluorescent (CFL) bulbs were more efficient than common incandescent bulbs. My hypothesis stated that they would be. Through my research and performing my procedure, I proved it correct.

My procedure consisted of finding a light receptacle or old lamp that you could use, getting both types of bulbs and a voltmeter to measure the current. I also found the tighter the bulb was fastened the more accurate the reading. Overall, the better choice to lower your electric bill is the compact fluorescent bulbs.

Project Number: MCS007

Grade: 8

Title: Protecting U & Me from UV & B

Abstract: The reason I'm doing this project is because I want to find out which SPF protects the best from getting sunburn (UVR). I hypothesized that SPF 50 would be the best from keeping the UV rays from turning the beads different colors. To do this experiment I first took 5 beads and put them in three ziplock bags, then covered the bag with SPF 50, 15, and 30. After I placed them on the window ledge and the beads changed color when the radiation hit them. In the end the SPF 50 kept the beads from changing color longer than SPF 30 and SPF 15.

Project Number: MCS009

Grade: 8

Title: Which Light is the Brightest?

Abstract: I wanted to test different flashlight bulbs to determine which was the brightest and at which distances they perform best. I built a photocell circuit with a voltmeter connected to the output as a display of light intensity. I recorded the brightness in a normal room which became my standard. In a dark room, I focused each flashlight on a grid at a distance of 15 feet to get the brightest spot. I performed the tests at various distances. At 15 feet, all of the bulbs were close in performance to each other. The krypton bulb performed best overall.

Project Number: MCS010

Grade: 7

Title: Vitamin C in Orange Juice

Abstract: Does orange juice have more Vitamin C than oranges, and if so, which is more cost effective? Oranges have the most Vitamin C value, but orange juice is more cost effective. This experiment is beneficial because it shows the true Vitamin C content in oranges and orange juices and the cost associated. Indophenol solution was prepared, and orange juice was slowly poured into 20 mLs of it until solution turned a rose pink in color. The first beaker

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

tested was kept as a comparison for samples. Beakers were cleaned and tests were performed for all variable groups. 3 trials were conducted. 3 trials were performed and data was collected. The 5 popular brands tested "off the shelf" orange juice contained about the same levels of Vitamin C. The titration tests performed on the orange juices were 98% consistent with the government's nutrition information, making it reliable. However, the Vitamin C levels in different types of oranges varied a lot, revealing a wide range of Vitamin C levels between several different types of oranges. Oranges that are squeezed for immediate consumption, on the average, contained higher levels of Vitamin C per 30mLs than any of the brands of orange juice. These differences may be partly explainable by the pasteurization process. Other processes of mass production and oxidation of the Vitamin C must account for the remainder of the differences.

Project Number: MCS011

Grade: 8

Title: Paper Power

Abstract: I chose this project because I wanted to know which brand of paper plates will hold the most weight. First, I will buy all of the items I need. Second, Prop up one plate from one brand of plate. Third, put weights on until the plate folds. Fourth, I record the weight. Then I repeat steps 2-4 for each plate. I will conduct my experiment on November 20, 2010. I will have my data and conclusion on that day.

Project Number: MCS012

Grade: 8

Title: Stains Disappear

Abstract: Which stain remover works the best? Procedure: 1. Prepare fabric. 2. Apply stains. 3. Let dry. 4. Apply stain remover. 5. Observe and record results. Data: Clorox removed all stains while vinegar and baking soda did not. Conclusion: Clorox is the better stain remover.

Project Number: MCS013

Grade: 8

Title: What Type of Storage Bag Keeps Produce Fresh the Longest

Abstract: The purpose of the experiment was to see whether certain bags keep fruits fresher longer. Procedure: Place strawberries in each bag and check daily. Write results. Graph data. Data. Conclusion: Green bags keep fruit fresher longer.

Project Number: MCS014

Grade: 8

Title: The Effect of Pancake Mix on Pancake Height

Abstract: The purpose of my project was to find if changes in pancake mix change a pancake's height. I selected this topic because I'm interested in cooking. Through experimentation, I had hoped to find the thickest pancakes. I made pancakes and measured their height during experimentation, resulting in Valu Time making the tallest; then Jiffy, Bisquick, and Heart Smart Bisquick; then homemade; and finally, the control being the thinnest. My recommendations for further study are testing more mixes because it would help more people decide which pancake mix to buy and it would minimize the errors made during experiments.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS015

Grade: 8

Title: Testing Laundry Detergent

Abstract: Purpose: To see which laundry detergent is the best at getting stains out of fabric. Procedure: Place socks on table. Stain socks with blueberries. Wash each sock with different detergent. Make observations. Conclusion: "Gain" was the best detergent to remove stains.

Project Number: MCS016

Grade: 8

Title: Paint Ball Stains

Abstract: Purpose: to see which type of paint stains clothing more. Procedure: 10 different colored paint balls are shot at cotton fabric, and then washed. Data: Ongoing. Conclusion: N/A

Project Number: MCS017

Grade: 7

Title: Do you really want to eat that?

Abstract: My experiment is, "Do hamburgers from fast food restaurants spoil?" The reason why I am testing if hamburgers from three major fast food restaurants spoil is to see if they are still edible after thirty days. The hamburgers will be untouched at room temperature and will have no condiments on it. I will see if this myth is fact or fiction. My project is still ongoing.

Project Number: MCS018

Grade: 8

Title: Which color absorbs most heat?

Abstract: The purpose of this experiment is for some day when I'm building a house, I'll know what color will keep it warmest. My procedures included, using a paintbrush, I evenly painted each brick a different color. I placed each brick underneath a light in the same room with a steady temperature for 2 minutes each. I then checked their temperatures with an infrared thermometer. I found that darker colors such as black and blue absorb the most heat, which brings to the conclusion that darker colors absorb more heat than lighter ones.

Project Number: MCS019

Grade: 7

Title: Burning Calories

Abstract: The purpose of my experiment was to determine the different amounts of chemical energy in different foods. I weighed the food, burned it, and then I weighed it again. I think that the peanuts will have the most energy because it has a lot of salt in it. Then I think that the popcorn will have the next amount because it has the most butter out of the other foods. Next the pet food will have the next amount of energy, then the bread, and last the marshmallows will have the least amount of energy. My future idea for this topic is to test more foods so that people will know how much energy is in each food they eat.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS020

Grade: 8

Title: The Effect of Coffee Cups on the Temperature of the Liquid

Abstract: I selected my topic because I wanted to know which brand was the best for keeping liquids warm. I hoped to prove that the McCafe cup was the best. In my experiment I gathered my cups, filled them with water, put them in the microwave, measured the temperatures before and after 30 minutes, and found the difference between the two temperatures. Respectively, the generic, Subway/Seattle's Best, McCafe, Sheetz, and Starbucks cups retain heat the best to the worst. Overall, people who like to drink warm beverages will benefit from my experiment.

Project Number: MCS021

Grade: 8

Title: Insulation Celebration

Abstract: In my experiment, I tested to see what type of insulation holds heat better, fiberglass or foam. I hypothesized that fiberglass would hold heat the best since it is made up of glass fibers held together with a binding substance. To do this experiment, I took the starting temperature in each house. Next, I put the houses outside on a 0 degree Celsius night for 20 minutes. After that, I took the ending temperature. I repeated these procedures twice.

Project Number: MCS022

Grade: 7

Title: The Choice is

Abstract: My experiment was conducted to investigate the difference between single-pane glazing and high performance glazing. Specifically, my tests endeavored to show how low-e, insulated glass units (IGU) save energy, while my research helped me to better understand why window performance is an important part of a building's energy use. The results of my experiment indicate that my hypothesis was correct; low-e type, high performance glazing significantly reduces the rate of heat gain from sunlight when compared to single-pane glazing units of the same size.

Project Number: MCS023

Grade: 7

Title: The Effect of Whitening Toothpastes

Abstract: Whitening Toothpastes are used to make teeth appear whiter. This experiment was chosen to find out what Whitening Toothpaste will perform the best. Eight adult teeth were stained in coffee for 24 hours. The teeth were separated into 4 different groups. There were 2 teeth in every group. The Whitening Toothpastes used in this experiment were Arm and Hammer Whitening Toothpaste, Colgate Whitening Toothpaste, and Aquafresh Whitening Toothpaste. Water was the control in this experiment. I recorded the shade of the teeth before and after every brushing, and I brushed each tooth the exactly same for 2 minutes. The results of the two trials were averaged. This experiment showed that Arm and Hammer Whitening Toothpaste whitened the best. Arm and Hammer performed the best because it contains a large amount of Sodium Bicarbonate (Baking Soda). Baking Soda helps whiten teeth because it dissolves into the water and penetrates the enamel, when brushing the baking soda removes the yellow and brown stains usually caused from coffee, team, smoking, and chewing tobacco. It will also remove the plaque that is on your teeth. The teeth in this group both changed five shades.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS024

Grade: 8

Title: Dawn vs. Gain: What cleans motor oil better?

Abstract: Which type of dishwasher detergent cleans up motor oil better, Dawn or Gain? That is what I figured out doing this project. What I did was got a car mirror and poured 2cc of motor oil on the mirror. Then I poured 1cc of Dawn on the motor oil and cleaned it with a sponge. I did the same thing with the Gain. After the tests I wrote my conclusions. My results were that Gain cleaned better than motor oil. My hypothesis was incorrect.

Project Number: MCS025

Grade: 8

Title: Energizing Nuts

Abstract: The purpose of my experiment was to discover if calorie amounts given on nut nutrition labels correlated with the food energy found in those nuts. I collected five varieties of nuts and burned them on a calorimeter. Temperatures from three trials were averaged. Averages were compared with calorie amounts. My data resulted as follows: Pecans 46.3 °C, 4.9 calories, Hazelnuts 45.7 °C, 4.4 calories, Cashews 42 °C, 4.25 calories, Almond 38 °C, 3.5 calories, Peanut 36 °C, 3 calories. I therefore concluded that the calorie amounts on nutrition labels correlated with the food energy of nuts, proving my hypothesis correct.

Project Number: MCS026

Grade: 8

Title: Batteries

Abstract: The purpose of my project was to determine which brand of battery lasts the longest, Energizer, Rayovac, or Duracell, to make it more beneficial for the consumers. I hypothesize that the Energizer batteries will last the longest because I see the most commercials for them, so they have a lot of money from people buying it so much, and if they keep buying it, it must last longer longest. I learned that three AAA batteries last longer than two AA batteries. I found that my hypothesis was wrong according to the AA batteries, but correct according to the AAA batteries.

Project Number: MCS027

Grade: 7

Title: The "Supreme" Whitening Strips

Abstract: Tooth whitening has recently increased greatly in popularity. Many whitening products are now available over-the-counter and also through the dentist. This experiment was intended to discover which type of whitening strips will whiten stained teeth the most effectively and which brand is most cost effective for the consumer. The hypothesis was that Crest Whitestrips Supreme will whiten stained teeth the most effectively. This brand was chosen because Crest Whitestrips Supreme are only sold through the dentist and are unavailable over-the-counter. The materials used were staining beverages, 35 teeth, beakers, 6 brands of whitening strips and a tooth shade guide. The procedure: Bleach teeth, prepare beverages, pour 50mL of each beverage into five beakers, place one tooth per beaker, do this for all whitening groups. Let teeth sit in stains for seventy-two hours, remove all teeth, record shade of each tooth, apply the assigned strips to each tooth, follow whitening instructions for each product. Compare teeth to the tooth shade guide, record all data found, make graphs, compare costs, and form a conclusion. It was determined that Crest Whitestrips Supreme whitened stained teeth the most effectively.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS028

Grade: 8

Title: Which Rust Worse

Abstract: My project was to determine the effect that different deicer had on steel wool. I tested three different kinds of deicers on steel wool to see what kind would make the wool rust the fastest. The reason that I did this project was to figure out the effect that deicers have on our cars. I think the deicers that cost the most will have a bigger effect or cause more rust than the ones that cost less money. I think this because cheap things always seem to work better. The next time that I do this project I will test the effect of the water too because in my project the water can also have a big effect on the wool rusting.

Project Number: MCS029

Grade: 8

Title: Candle Time

Abstract: To see which color candle burns the longest. Procedure: create a back drop open the candles save bar code, glue bar codes to each plate, throw away trash put plates under candle holder, place candle in corresponding place, create labels straighten candle wicks, move all non-essential items from work area * tape, scissors, ruler, marker, camera, place fire extinguisher close at hand, set timer on corner of table quickly light candles in a row *keep track of time between the lighting of each candle, record data every thirty minutes finally take pictures every half an hour. Data after the first 1/2 an hour the white was 34.925cm, red clay 36.384cm, coral bell 36.384cm, light purple 34.925cm, garden rain 34.925cm, and the dark yellow was 34.713cm repeating. After the second 1/2 an hour white 33cm, red clay 34.7cm, coral bell 33.8cm, light purple 33.7cm, garden rain 33.8cm, dark yellow 33.8cm. After the third 1/2 an hour the white was 30.46 red clay 33cm, coral bell 33 cm, light grape 32.15 cm, garden rain 32.15cm, dark yellow 32.15 cm. At the end of my experiment i found that the white was 28.76cm, red clay 31.32cm coral bell 31.32cm, light purple 31.32cm garden rain 30.46cm, and dark yellow 30.46cm. Conclusion: I found that at the end of the experiment the white candle had burned approximately 1.267 cm faster per 1/2 hour.

Project Number: MCS030

Grade: 8

Title: The effect of bat material on the distance a ball travels

Abstract: My experiment is on the effect of bat material on the distance a ball travels. I did this experiment because I want to be the best softball player that I can be, and hitting is a huge part of the game. By doing this project, I found that wooden bats are the worst, aluminum bats are the second, and composite bats are the best. I tested two composite bats, the DeMarini Phenix(carbon reinforced) and the Anderson RocketTech(end-loaded.) I found the DeMarini Phenix to have a better average distance the ball traveled.

Project Number: MCS031

Grade: 7

Title: Got Sugar?

Abstract: First I will, get all my materials and ask ten people to test. Then, I will take one of the four sugars (Sweet n Low, Splenda, and Equal).And pour it into one of the four pitcher s with two and a half cups of water, with five packets of the sugar and five tablespoons of real lemon juice. I will stir it forty-five times until it is dissolved. After that, I will have them write what they thought of the taste and to scale the sweetness from one to ten. Before I move to

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

the next sugar, I will wait five minutes. After I am done, I will repeat the steps. Finally, I will gather my findings and determine the results.

Project Number: MCS032

Grade: 8

Title: The Effect of Heat during Washing and Drying on the Size and Color of Material

Abstract: The purpose of this experiment is to show that heat during washing and drying causes shrinking and fading. Material squares were washed, dried, and measured for length/width and color changes. For the results, in order to most to least fading was hot wash/low dry, hot wash/regular dry, hot wash/air fluff, cold wash/low dry, cold wash/regular dry, and cold wash/air fluff. In order of most to least shrinkage was cold wash/low dry, hot wash/air fluff, cold wash/regular dry, cold wash/air fluff, hot wash/ low dry, and hot wash/regular dry. The most heat exposure did not cause the greatest shrinking and fading.

Project Number: MCS033

Grade: 7

Title: How Different Milks Affect Cheese

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

Project Number: MCS035

Grade: 8

Title: Vitamin C Content in Oranges

Abstract: The purpose of my experiment is to determine which type of orange has more vitamin C. Oranges were squeezed in separate containers. The experiment was started with 50 drops of Vitamin C Indicator in each test tube. Then I dropped the organic orange juice one drop at a time. The less amount of drops that takes the blue solution to turn 'clear' means that there is more Vitamin C present. Repeated with regular oranges. My data showed that it took 10 drops of organic orange juice and 14 drops of regular orange juice for the solution to turn clear. I concluded that organic oranges contain more vitamin C than regular oranges.

Project Number: MCS036

Grade: 8

Title: Is Hefty Really the Heftiest?

Abstract: The purpose of my experiment was to test the strengths of three basic brands of 30 gallon garbage bags. The Procedure that I followed for my experiment was as follows:
i. Stretch two bungee cords between two sturdy desks, ii.Lace the cords through the bags at exactly 15 cm from the top and sides, iii.Weights will added one at a time until the bottom rips out of the bag, iv. Add together all of the weight of the objects placed in the bag prior to the tear, v. Repeat the experiment three times to verify my results. The data I collected included the following: Glad held 7.5 pounds, Hefty held 13.5 pounds, and Great Value held 18.5 pounds before tearing. I concluded that based on my results, Great Value 30 Gallon Garbage bags are the strongest garbage bags.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS037

Grade: 7

Title: Does Plastic Wrap Keep Food Moist?

Abstract: Which brand of plastic wrap prevents evaporation best? Testing 6 different brands of plastic wrap. Prepared 12 50ml clear glass cylinders with water and added 4 drops of six different food colorings to pairs of cylinders. Stretched plastic wrap over cylinders, set at 65 degrees F. for 6 weeks and recorded data for evaporation. The hypothesis was Stretch-tite plastic wrap would show the best results. The results showed that Saran Cling Plus and Great Value prevented the best evaporation. Therefore, the hypothesis was not supported.

Project Number: MCS038

Grade: 8

Title: How does sand type affect the durability of a brick?

Abstract: The purpose of my experiment is to find which type of brick is more durable, a brick made up of fine sand or a brick made up of coarse sand by using a brick press. I first gathered all of the materials needed to conduct my experiment and then I will use a brick press to find out how much weight each type of brick could withstand. I have not yet gathered all of my data because I am still conducting my experiment at the moment; therefore, I do not have a conclusion to present either at the moment.

Project Number: MCS039

Grade: 7

Title: Finding the Best Stain Remover

Abstract: Removing stains is a day to day problem. Many detergents are available in the market, and most effective choice is not known. I wanted to know which detergent was scientifically the best choice, Although Tide did the best job in removing MORE stains, Arm & Hammer did do a better job in removing one out of my three stains, so I conclude that different laundry detergents work differently for different stains.

Project Number: MCS040

Grade: 8

Title: Melt Down

Abstract: In my science fair project, I took five different colored candles, lit them, and determined whether or not if the color of the candle affects how much wax the candle burned. The colors were red, blue, yellow, green, and orange. All of the candles burned for four hours on five different days.

Project Number: MCS041

Grade: 8

Title: Energy Drinks?

Abstract: My project is a project that tests the differences in effects between then energy supplements, 5 Hour Energy, and Original Amp Energy. What I did was I bought two Amp Energy drinks in 16 FL/oz. cans, and one bottle of 5 Hour Energy. Split up into four days, I drank a substance at 7:00 AM, varying substances each day of experimentation, and recoded the effects of each substance I felt at the time of experimentation. I concluded with energy drinks giving me a boost of a energy and focus, and 5 Hour Energy having an almost unrecognizable amount of effect.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS042

Grade: 7

Title: Duracell Beats the Bunny

Abstract: Batteries are used commonly everyday in many places- in our cars, our PCs, laptops, portable mp3 players, and cell phones. This work is intended to learn if Energizer, Duracell, and other battery commercials are advertising truthfully stating their battery lasts the longest. Six different battery brands were put into six identical flashlights. The voltage was tested with a voltmeter after every two hours, and the data was recorded until the batteries ran out. The test was completed three times to ensure accuracy, then results were averaged for each brand and compared to the cost. It was determined that the Duracell battery did last the longest. However, if you want the most for your money then the Eveready brand of batteries is the best choice. Future work is planned to test more brands of batteries

Project Number: MCS043

Grade: 8

Title: The T.V. is off. . .Or is it?

Abstract: Question- Do electrical devices consume phantom power (wasted power) when they are off? Rationale- one can save money and help preserve the environment by knowing about phantom power. Procedure- test devices in home and classroom for phantom power and find how much the school can save. Data- Ovens, washing machines, etc. don't consume phantom power, TV's, telephones, etc. do. During summer the school can save \$2,521.49 by unplugging classroom objects (projector, TV, etc.). Conclusion- Heat objects don't consume phantom power, but other electrical objects do. One can save money by unplugging these objects.

Project Number: MCS044

Grade: 7

Title: Stick with the best

Abstract: "Stick with the best", will determine which type of glue bonds best with wood. To do the experiment, I will adhere a small piece of wood to a large piece using super glue, wood glue, and liquid nails. A bucket filled with weights will be suspended via an S hook from a hanger attached to the wood and timed to see how long until the bond breaks. The experiment is still ongoing.

Project Number: MCS045

Grade: 8

Title: The Effect of Ultraviolet Light on Foundation Make-up

Abstract: By completing this project, I hope to help women purchase the right make-up foundation that will protect their skin, and is also worth their money. To find which foundation was the best, I used ultraviolet detecting beads and put different foundations on them. Then, I put them under a sun lamp so they would be under the same type of light as they would in the sun. When I concluded this experiment, I found that Covergirl foundation worked the best, then Neutrogena, Maybelline, and then the Dollar Store Brand. This experiment was very successful and helpful.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS046

Grade: 8

Title: How does different packaging affect the spoilage of apples?

Abstract: The purpose of my experiment was to find which type of packaging affects the spoilage of apples and overall keeps produce the freshest. To test this I wrapped apple slices in 5 different types of storage packaging and weighed them every other day. The one which lost the least amount of weight is the one that decomposed the least. After performing my experiment, the results show that both plastic wrap and sandwich bags are the best packaging for they both had the same total weight loss while the others had a more significant total weight loss.

Project Number: MCS047

Grade: 8

Title: The Effect of Fats and Oils on the Taste and Texture of Cookies

Abstract: I chose this experiment because I thought it would be interesting. I had hoped to find an alternative to butter in cookies. First I made the cookies then I fed them to my test subjects to be rated for taste, texture, and appearance. Out of the 5 different oils and fats I used, vegetable oil came in first with the smart balance as a close second and canola oil coming in last. In my experiment I tested oils to find a healthier alternative to butter in cookies that still tasted and looked good. I succeeded in finding one.

Project Number: MCS048

Grade: 7

Title: Pop Weaver or Orville. Which has more Kernels?

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

Project Number: MCS049

Grade: 7

Title: Best Poppin' Popcorn

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

Project Number: MCS050

Grade: 7

Title: Not All Swimsuits are Created Equal

Abstract: I chose to do my project on which brand of swimsuit is more resistant to the effects of chlorine. I tested 2 brands, Speedo and Dolfin, by taking five pieces of each and soaking them in chlorinated water for the same amount of time as my swimming practices. I predicted that Speedo would be blacker, thicker, and more elastic based on personal experience and research on the fabrics. I ran the experiment over the course of a month. I found that both brands ranked highest on the grayness scale, and Speedo ranked highest on the thickness and elasticity scale.

CONSUMER SCIENCE - INTERMEDIATE (7TH-8TH GRADE) - MCS

Project Number: MCS051

Grade: 7

Title: The Adhesion of Glue

Abstract: The purpose of my project was to find out what glue is the best at adhering to wood, plastic, and metal and is able to support the most weight. I tested Super glue, Elmer's Wood glue, Elmer's Glue, and Gorilla Glue. The procedure for testing my project was to glue one testing surface to another right in the center. The surfaces were crossed so that I was able to get weight on them. The one surface was supported on two end tables while the other had a chain attached to each side of the adhered portion that led into one end with a bucket attached. I filled the bucket with sand until the adhesion failed and then weighed the bucket. Super Glue's average weight held was 10.7 kg. Wood Glue's average weight held was 4.59 kg. Gorilla Glue's average weight held was 10.2 kg. Elmer's Glue's average weight held was 5.7 kg. Super Glue had the highest average but Gorilla Glue was close behind. My conclusion is that Super Glue and Gorilla Glue are the best glues. Even though Super Glue had the highest average, both glues held the most weight on three out of six of the combinations of surfaces. I would use either of these two glues for any project or job

Project Number: MCS052

Grade: 8

Title: Please Keep Me Cool

Abstract: This project is about three liquids, (water, Gatorade, and syrup) heated to boiling point and then cools to room temperature the fastest. It also deals with heat convection. Heat convection is the movement of molecules within fluids (liquids and gases) and rheids. The type of heat convention that my project deals with is called natural convection. I used 60 fluid ounces of each liquid. Included here are the graphs made from my results and it has pictures of the different liquids. It also contains the table of contents, including the people and websites that helped me.

Project Number: MCS053

Grade: 7

Title: Which Mouthwash Kills the Most Oral Bacteria?

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

Project Number: MCS054

Grade: 7

Title: Got Water?

Abstract: As American's are becoming more aware of making healthy food choices; there is a message to promote bottled water as a drink of choice. This caused me to consider what the result of all of those empty plastic drink bottles does to our environment and if making healthy drink choice created an unhealthy environment. I wondered what the difference is between bottled, tap and filtered water. So my research problem became, is there a difference in the levels of purity among tap, bottled and Brita filtered water? This is how I arrived at my hypothesis: As the different types of water are tested the amount of impurities/ contaminants found in tap water should be the most concentrated. What I expected to discover was that tap water would have more impurities than either bottled or Brita filtered water. The logic behind this was the fact that when we purchase bottled water or process our tap water in a Brita filter that we are getting a cleaner end result because we are paying for the clean benefits. it does not make sense to purchase a product that literally goes down the drain whenever we turn on a faucet.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES001

Grade: 8

Title: Oil Be Gone

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

Project Number: MES002

Grade: 8

Title: Recycling Efficiency

Abstract: This experiment was conducted to find the paper with the highest recycling efficiency. The procedure was to cut the paper and put it in a blender with a certain amount of water. Then the mixture was put on a screen, spread evenly and left to dry. The paper was Graded on a qualitative data scale and the mass of both the original paper and the recycled paper were taken. The conclusion was that cardstock paper produced the highest efficiency paper in terms of its mass recovery and copy paper produced the highest efficiency in terms of its quality.

Project Number: MES003

Grade: 8

Title: Bye Bye Bugs! A Study of Homemade Ant Repellents

Abstract: Three different common household substances, baby powder, cinnamon and nutmeg, were evaluated for their ability to repel ants without harming them. Further study focused on whether or not the ants were repelled due to the odor or the "feel" of the substance.

Project Number: MES004

Grade: 7

Title: Fanfare

Abstract: My project called Fanfare was to see whether a turbine with two blades, four blades or six blades would catch the most wind to produce more energy. Hypothesized that the turbine with six blades would catch the most wind. My hypothesis was correct. The first thing I did was place the fan on a flat surface, and then I put the turbine in front of the fan and plugged the voltmeter into the turbine. I put two blades on the turbine, then four and six. I recorded my results. The reason I chose this project was to see if there is a cleaner more efficient way to produce electricity. The turbine with six blades caught and produced the most energy.

Project Number: MES005

Grade: 8

Title: Whether the Weather Affects Deer

Abstract: The purpose of this experiment was to figure out the best weather conditions to go hunting. The hypothesis was that low precipitation and low temperatures will result in more deer signs. The procedure was, first place trail camera in area with deer signs. Then place the same amount of corn in the same in the same place every day in view of the camera. Next, record weather (precipitation and temperature) each day. Finally, retrieve pictures from trail camera and compare the number of deer with the weather conditions. The conclusion was that, on oct.3rd the temp was 58 degrees Fahrenheit. Precipitation was .57 inches. Five deer

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

were seen. Oct. 4th had a temp. of 53 degrees Fahrenheit and precipitation was .03 inches. Five deer were seen. On Oct. 6th the temperature was 51 degrees Fahrenheit and the precipitation was .38 inches. There were seven deer and two of those were bucks. Oct. 7th the temperature was 70 degrees Fahrenheit and no precipitation. Three deer were seen. On Oct. 8th the temperature was 74 degrees Fahrenheit and no precipitation. Two deer were seen. On Oct. 9th the temperature was 79 degrees Fahrenheit with no precipitation. No deer were seen. Therefore, the data shows that the colder the temperatures and light precipitation caused more deer movement. Hunters should know this so they can pick the best days to go hunting.

Project Number: MES006

Grade: 8

Title: What Size Wind Turbine Blade Produces the Most Energy?

Abstract: In my project, What Size Wind Turbine Blade Produces the Most Energy? I am testing blades sizes 6 cm, 8 ½ cm, and 12 cm blade, to see which blade produces the most energy. I will use a 60 watt light bulb and eight solar cells to power the motor, where the blades are tested. I will read the amount of energy produced by using a voltmeter. In the data shown the 6 cm blade produced the most energy with an average of 2.072, more energy produced then the other two blades. So the smaller blades for a wind turbine will produce more energy.

Project Number: MES007

Grade: 7

Title: Magic Cup

Abstract: I did this experiment to find out what is causing the water to not fall out of the cup. First, I filled the whole cup with water and then I started to experiment with different levels of water. After that, I added some coins to the water in the cup to see if the atmospheric pressure can hold more weight than just the water in the cup. I went to the Internet to find how to calculate the Atmospheric Pressure, mass of the cup and more things like that. This is my data: The downward force acting on the lid is equal to the mass of water and coins in the cup multiplied by the acceleration due to gravity. Downward Force = Mass * Acceleration due to gravity = Mass in pounds * 32.2 ft./sec² The upward force acting on the lid is equal to the atmospheric pressure multiplied by the surface area of lid that is covering the cup. Upward Force = Atmospheric pressure * Area of cup opening = 14.1 pounds / inches² * Area in inches². The water will not fall out when the upward force acting on the lid is greater than the downward force acting on the lid. I finally figured out that the cup is being held by two forces atmospheric pressure and surface tension. The force that is acting upwards is atmospheric pressure, and that force is greater than the water which is the downward force. Surface tension helps in holding the lid and cup together. Atmospheric pressure and surface tension can hold more weight than just water.

Project Number: MES008

Grade: 8

Title: The Effect of Graywater on Raphanus Sativus

Abstract: The purpose of my experiment was to see if Graywater was a suitable replacement for tap water. I selected this topic because I wanted to help conserve water. I hoped to prove that there were ways of recycling used freshwater on plants. I grew 36 plants with each variable: sink, washing machine, bathtub, dog bowl, rain, and tap water. I recorded each plant's growth over 6 weeks. From best to worst the results were: control, bathtub, sink, dog

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

bowl, rain water, washing machine. Even though control grew best, the others could still be used to water your lawns and gardens.

Project Number: MES009

Grade: 8

Title: Protect our Planet with Plants

Abstract: The purpose of this experiment was to see which oil (avocado, vegetable, olive, vegetable, or nothing) can be absorbed the most effectively by elodea (under light or no light)? It was predicted that Elodea would absorb the most vegetable oil under a light because vegetable oil is the lightest of all the oils I used. Also, if the plant was under a light, it would be more effective than in the dark because it would photosynthesize more. Botanists and Environmentalists would be interested in the results of this experiment.

Project Number: MES010

Grade: 7

Title: Gravity - That's How It Rolls

Abstract: To investigate landslides, I hypothesized that if bigger particle sizes were used then steeper slopes could be sustained. Using four Grades of sand: coarse, medium, fine, and ultra fine. a measured amount was put into similar jars. Each was placed on its side and brought it upright to measure the angle of the slope with a protractor. This was done with dry and wet sand. The average slope of the dry sand was 32.6 ± 3.0 , and the wet sand fell to 4.9 ± 5.0 . The course sand with water had a slope of 11.7 ± 6.0 and the ultrafine was 1.8 ± 1.0 . Research is still being conducted. Final Abstract will be available at my exhibit on Fair Day.

Project Number: MES011

Grade: 8

Title: Get Into Hot Water

Abstract: My purpose for doing this project was to see which material placed at the bottom of a solar water heater improved its performance. Using different materials in five solar water heaters, I measured the water temperature in each heater at different time intervals on three different occasions. I recorded my results in a notebook. My results showed that the fiberglass insulation made the heater perform the best while the control performed the worst. My project taught me that, while solar water heaters perform well, adding certain materials to the heater can improve its efficiency, especially in a northeastern climate.

Project Number: MES012

Grade: 7

Title: Does the Different Color of Light Affect the Rate at Which Food Spoils?

Abstract: In my project I am going to put bananas under four different colors of light. The light colors would be blue, red, white, and yellow. I will check on it once a day for one week. I will do this process three times.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES013

Grade: 8

Title: Oil Spill Solutions

Abstract: The purpose of this experiment was to determine which material absorbs the motor oil the best. 100ml of motor oil was added to each pan. 30g of sawdust, sand, cat litter, polypropylene pad, and cotton batting were added to separate pans. They were allowed to absorb the oil for 15 minutes. The contents of each pan were poured into mesh strainers and had 15 minutes for the unabsorbed oil to drain into glass metric measuring cups. The sawdust absorbed an average of 90ml of motor oil. The sand absorbed an average of 21ml of motor oil. The cat litter absorbed an average of 22.5ml of motor oil. The polypropylene pad absorbed an average of 100ml of motor oil. The cotton batting absorbed an average of 100ml of motor oil. The polypropylene pad and the cotton batting absorbed the motor oil the best because both absorbed all 100ml of motor oil. A real world example of this is if motor oil is spilled at a home or a business and it needs to be cleaned. The person cleaning it would need to know that the polypropylene pad or the cotton batting would clean and absorb the motor oil the best.

Project Number: MES014

Grade: 8

Title: What Heats the Fastest ?

Abstract: The reason I choose this project is because I wanted to see if you're in home in home heating system. The way I when about this project is that I started at a room at 15.55 Celsius and then I let it heat up 5 degrees for wood, wood pellets, and natural gas I did this three times. I found out that wood raised the tempter the fastest with a average of 16.6mins. I concluded that wood is better than the rest of the fuels.

Project Number: MES015

Grade: 7

Title: Time After Time

Abstract: The primary objective of this study is to determine the accuracy of an ancient time keeping method when compared to a modern time keeping method. A bowstring equatorial sundial was constructed. The calculation of proper longitude and latitude for Pittsburgh coordinates was determined. A battery operated clock was used as a control. Shadow observations were recorded at 30 minute intervals for two consecutive hours. A camera was used to record observations. The shadow observations captured every thirty minutes on the equatorial sundial were recorded from twelve noon (the center of the arc) until two in the afternoon. Thirty minute shadows appeared crisply and consistently. My data indicated the sundial was indeed as accurate as a modern timekeeping device (clock). Performing this experiment in winter made this experiment more challenging.

Project Number: MES016

Grade: 8

Title: With or Without Magnets

Abstract: The purpose if this experiment was to tell whether magnets effect Radish plant growth. The independent variable was the plant growth, the dependant variable was the magnets, and the control was the plants without magnets. The materials were 4 pots, potting soil, 2 cow magnets, Radish seeds, shop light, and a timer. The steps were put 5 cups of potting soil into each pot, in 2 of the pots put a cow magnet in the middle with the north end facing up, plant 10 seeds in all 4 pots, put the pots under a shop light, set the timer to turn the shop light on at 6 am. And off at 6 pm. Give plants ¼ cup of water every day. The 2 plants with

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

magnets were 9 cm tall; the 2 plants without magnets were 10 cm tall. The conclusion was that there wasn't a big difference in growth the plants without magnets were 1 cm taller than the plants with a magnet.

Project Number: MES017

Grade: 7

Title: Safe Snowfall?

Abstract: When you think of pollution, you probably think of water, soil, and air. Pollution can also affect one important weather condition in the winter. When snow is polluted, it can be dangerous to people, animals, and plants. Snow is one type of precipitation that can affect the environment after it starts to melt and enters the water system. Snow is affected by air because the clouds it forms in can travel through smog and other harmful chemicals in the air such as sulfur dioxide. This can cause the snow to be like a frozen acid rain. The hypothesis of this experiment is to determine if the chemicals from industry and naturally occurring substances taints the snow. Is there a difference between snow that falls in an urban setting versus a suburban or rural area. Multiple samples of snow from various sites around Allegheny County will be collected in a sterile bag. After the snow has melted, test strips will be used to conclude water quality and the amounts of chemicals in melted snow. Melted snow will also be filtered through a weighted filter to determine the amount of solid material it contains. Based upon the results, it will be demonstrated whether or not the fallen snow contains non soluble materials and chemicals that could be potentially harmful.

Project Number: MES018

Grade: 7

Title: Dark or Light?

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

Project Number: MES019

Grade: 7

Title: Oil Spill Effects

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

Project Number: MES020

Grade: 8

Title: What Material Best Absorbs Oil Out of Water?

Abstract: I chose this experiment because of the recent Gulf of Mexico Oil Spill. I wondered what the crews used to clean up the oil and if there was a better way to do so. The procedures I used in this experiment are: I filled a 500ml beaker with 250ml of water and 250ml of oil. I then inserted one material at a time into the beaker, took it out and recorded the results. Sponge absorbed the most oil from water followed by polyester, cotton, then cardboard. I concluded that sponge absorbs the most oil out of water.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES021

Grade: 8

Title: Which Paint Color is Best?

Abstract: Oil-based paints are waterproof, but for how long? This experiment was to see what color of oil-based paint can have the best quality after a period of time in four different situations. Four boards were placed in locations with different amounts of light and exposure to weather. Each board had a stripe of black, yellow, red, and white oil-based paints painted on the front. Each day the temperature and weather was recorded and the experiment shows that using red oil-based paint inside a house that gets little sunlight will have the longest and best quality.

Project Number: MES022

Grade: 8

Title: How Does Air Movement Affect Evaporation

Abstract: Purpose: To see the effect that air speed has on water evaporation. Procedure: Place 2 cups of water in 3 different cups. Place each cup in 3 separate rooms; a mild air speed room, a no air speed room, and a high air speed room. After 24 hours, the amount of water remaining was measured and recorded. The process was repeated for 3 days. Data: Test one: High air speed room lost 1.8 ounces of water. Mild air speed room lost 1.1 ounces of water. No air speed room lost 0.6 ounces of water. Test two: High air speed room lost 1.9 oz of water. Mild air speed room lost 1.0 oz. No air speed room lost 0.4 oz. Test 3: High air speed room lost 1.8 oz. Mild air speed room lost 1.0 oz. No air speed room lost 0.5 oz. Conclusion: The room with the fastest air speed lost the most water.

Project Number: MES023

Grade: 7

Title: Keeping Things Warm, What Material Insulates Best?

Abstract: The interior of identical boxes were lined with various materials (paper, cotton batting and aluminum foil) to determine which would allow the box to hold heat the longest. A second phase of the study focused on using several layers of the insulator proven best in the first phase.

Project Number: MES024

Grade: 8

Title: Runoff Water vs. Tap Water

Abstract: My science project was about how plants grow and what effects their growth. The purpose of the project was to see if runoff water does or does not affect plant growth. The procedure I used for the project was measuring the growth of the tap and runoff water plants and comparing their growth. The data I had was that the tap water plants grew better than runoff water plants. The conclusion of my project was that tap water plants did grow better than runoff water plants, and my hypothesis was correct.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES025

Grade: 8

Title: Sweet Organic

Abstract: The purpose of my project of my experiment was to see if organic soil or inorganic soil would make the plant grow faster and to compare organic soil vs. inorganic soil. I picked out a flower seed and I watered it and I watched it and recorded data for two weeks on every other day and took pictures of the plants. I choose this project because I really didn't know what the difference was between inorganic or organic was and which would work better and now I know that if I wanted to plant a plant to use organic soil and I could help people who like to plant things. The results of my project were that organic worked better and made the plant grow faster than the inorganic soil. The conclusion was that my hypothesis was correct and organic soil works better than inorganic soil. My future idea with this project is to do the same thing again.

Project Number: MES026

Grade: 8

Title: Back of the Bus

Abstract: The title of my project is "Back of the Bus." I chose this Title because in my experiment I was trying to find out if sitting in the back of the school bus is harmful to my health. I tested for four gases Carbon Dioxide, Carbon Monoxide, Nitric oxide, and Nitrogen Dioxide. I also tested for concentrations of particulate matter. For these tests I used air quality instruments to measure the gas and particulate matter concentrations. I downloaded all the data from these instruments into spreadsheets then analyzed the data. My data showed that there was no evidence of any gases in the back of the school bus. The particulate matter stayed under the exposure limits but doubled when I sat in the back seat compared to when I stood outside.

Project Number: MES027

Grade: 8

Title: Does calcium chloride or rock salt melt more ice?

Abstract: My purpose for completing this experiment is to see which material works better on melting ice. This way people will know to use either rock salt or calcium chloride in the wintertime. I did this experiment five times, each time by putting the same amount of each ice-melter into a cup with 1/8 cups water in each cup. I evenly distributed the mixture over two blocks of ice at the same time. I measured how much ice was melted away from each block and found calcium chloride melted the most ice away all five times.

Project Number: MES028

Grade: 7

Title: How's the weather up there?

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

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES029

Grade: 8

Title: Filtering the Faucet Pharmacy

Abstract: My project was to test if water filter systems will remove the pharmaceutical acetaminophen from water. I tested two brands of water purifying systems, Brita and Pur. I dissolved both solid and liquid acetaminophen in various concentrations, put each sample through both filter systems, and analyzed the samples with a UV spectrophotometer. My results table showed that the best removal system for both solid and liquid acetaminophen was the Pur filter. I can conclude that some water filter systems do remove acetaminophen from water.

Project Number: MES030

Grade: 7

Title: Using Parallax to Judge the Distance of Objects

Abstract: I set up object 1, made sure it was level, and a reference point was located in the distance. I pointed my viewer at it, the line of sight was on object 1 and reference point. I marked the point where I viewed object 1. A pin was placed at the center of the viewer. I used trigonometry to help me make a baseline. I moved the viewer a distance along the baseline, making point 5 keeping the same line of sight direction. A pin was used to mark the location of object 1. The viewer was turned so its line of sight was pointed at the reference point. I used another pin to mark object 1's location. The previous steps were repeated on the other side of point 1.

Project Number: MES031

Grade: 8

Title: Tea Plants

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

Please visit student's exhibit for the Abstract.

Project Number: MES032

Grade: 8

Title: Worm Growth

Abstract: This project focused on the growth of worms over a period of 6 weeks. This researcher tested earthworm in different food sources. Food sources like banana peels, wet news paper (or the ink on the paper), crushed egg shells, and a mixture of the three. Earthworm were placed in four ice cream buckets, which were $\frac{3}{4}$ full of dirt; the earthworms would eat and do as they pleased for a week, until it was time to measure them. Every Saturday night the earthworms were measured. The data showed a change in worm growth with the different food sources.

Project Number: MES033

Grade: 8

Title: Mohs hardness Scale

Abstract: I have many reasons for doing this experiment. One of the reasons is that I Am really into geology. I collect many types of minerals but one of my favorite types is "Geodes".

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

And that is why I chose them as my test subject on my project. My procedure was; Step one take out two geodes from my rock collection. Step two scratch them two rocks together. Step three if neither rocks scratches against each other then scratch on a common house hold object. Then record observations and results. Conclusions- Geodes are ranked 2 on mohs hardness center.

Project Number: MES034

Grade: 8

Title: Comparing Indoor Plant Growth

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

Project Number: MES035

Grade: 7

Title: Do environmental conditions Affect Biodegradability

Abstract: The purpose of this experiment was to determine whether environment conditions affect its biodegradability. Ten biodegradable cups were placed in five different environments: sand, salt water, tap water, soil and control group. After 80 days, the cups were weighed with a fine balance (in grams). When weighing the cups, it was discovered that the sample in the salt water environment had lost the most mass (8.708g), while the sample in the sand environment had gained weight mass (8.839g). It was concluded that the sample in salt water lost the most mass and was therefore the environment that biodegraded best.

Project Number: MES036

Grade: 8

Title: Measuring Relative Humidity

Abstract: Understanding relative humidity can help keep you and your family healthy. Indoor relative humidity levels should be kept at a maximum of fifty-five percent to avoid mold growth which can lead to health problems. I will measure relative humidity in a controlled environment. I will construct a psychrometer to measure the relative humidity (dependent variable) of bathroom air. A series of controlled tests will be conducted using the psychrometer with the shower running at various temperatures (independent variable), and also turned off. I hope to demonstrate that relative humidity can be measured with accuracy using only a homemade device. Research is still being conducted. Final Abstract will be available at my exhibit on Fair Day.

Project Number: MES037

Grade: 8

Title: Which Biodegradable item produces the most potential energy through methane gas?

Abstract: The purpose of this experiment was to determine which biodegradable item produces the most methane gas, which can then be converted into energy. This project used separate bins to hold decomposing substances: bananas, grass clippings, leaves, newspaper, and no substance for the control. Bins were connected through aquarium tubing to bottles where they displaced water with the gas produced, and the gas was then be measured. The newspaper yielded the greatest amount of gas (12 cubic cm.), with grass clippings producing the least (3 cubic cm.). This project benefits bio-methane conversion in landfills because it optimizes the process.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES038

Grade: 8

Title: Our Oceans' Future Health Care Plan

Abstract: The recent oil spill disaster in the Gulf of Mexico demonstrated a critical need for more adequate oil clean-up methods. The purpose of the experiment was to test oil clean-up methods in a simulated ocean environment. Large quantities of the oil were still in the ocean after the oil recovery methods were used. The procedure was to take one clear glass 1,500ml beaker and fill it with 1,000ml of water and 3.5 grams of salt. Add 100ml of 30w motor oil to the beaker. The experiment will be performed with four independent variables. The independent variables are sawdust, cornmeal, cat litter, and artificial wind and light. The independent variables will be substituted for each other when tested for absorption. Each independent variable was placed in a metal sieve and lowered into the oil for 30 seconds. The sieve was then allowed to drain for another 30 seconds over the oil and saline solution. The oceans natural environment and was the control which has a salinity of 3.5%. The artificial wind and light experiment was demonstrated by placing a fan and a light bulb over the oil and saline solution for 12 hours. The results show that although, each independent variable absorbed some oil, the independent variables didn't absorb all the oil. Therefore the data concludes that cat litter worked the best which absorbed 2.75 mm on average, sawdust absorbed 2.0mm on average, cornmeal absorbed 2.50 on average, and the artificial wind and light absorbed/evaporated .5mm on average.

Project Number: MES039

Grade: 8

Title: Radiating Heat

Abstract: The recent oil spill disaster in the Gulf of Mexico demonstrated a critical need for more adequate oil clean-up methods. The purpose of the experiment was to test oil clean-up methods in a simulated ocean environment. Large quantities of the oil were still in the ocean after the oil recovery methods were used. The procedure was to take one clear glass 1,500ml beaker and fill it with 1,000ml of water and 3.5 grams of salt. Add 100ml of 30w motor oil to the beaker. The experiment will be performed with four independent variables. The independent variables are sawdust, cornmeal, cat litter, and artificial wind and light. The independent variables will be substituted for each other when tested for absorption. Each independent variable was placed in a metal sieve and lowered into the oil for 30 seconds. The sieve was then allowed to drain for another 30 seconds over the oil and saline solution. The oceans natural environment and was the control which has a salinity of 3.5%. The artificial wind and light experiment was demonstrated by placing a fan and a light bulb over the oil and saline solution for 12 hours. The results show that although, each independent variable absorbed some oil, the independent variables didn't absorb all the oil. Therefore the data concludes that cat litter worked the best which absorbed 2.75 mm on average, sawdust absorbed 2.0mm on average, cornmeal absorbed 2.50 on average, and the artificial wind and light absorbed/evaporated .5mm on average.

Project Number: MES040

Grade: 7

Title: Effect of Oil Spills on Plants

Abstract: Over the last decade, more than one billion gallons of oil, worldwide, entered the ocean due to oil spills. I wanted to find out the effects of oil spills on aquatic plants. So, I did an experiment involving two plants, one under normal water, and the other under water with a layer of oil on the surface. I measured the amount of oxygen produced by each plant over the

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

course of five hours. The plant without a layer of oil produced oxygen throughout the five hours, while the plant under a layer of oil stopped producing oxygen after approximately three hours. The plant under a layer of oil will soon die because it cannot perform photosynthesis. The oil is not only killing plants, but also affecting organisms that are dependent on plants for food and oxygen.

Project Number: MES041

Grade: 8

Title: The Single Side of Our Moon

Abstract: The purpose of my experiment is to determine whether or not we only see 50% of the moon. My procedure entailed focusing my telescope on the moon, using a Canon camera to picture every night for a full moon cycle, and comparing them to a moon chart, and themselves. My data comprised of over 200 pictures of the moon at varying stages, and my conclusions. The latter entailed that we do see only 50% of the moon.

Project Number: MES042

Grade: 8

Title: Oil Spills... a Big Problem

Abstract: The **Title** of my science fair project is Oil Spills... a Big Problem. I wanted to find out what material absorbs oil the best, sawdust, cat litter, dirt or sand. My hypothesis is that dirt would absorb the most oil. The procedure started with placing one tablespoon of each of the four materials in a Petri dish with one tablespoon of oil. The materials sat for twenty-four hours. The oil was then removed from the materials and measured to see which material was the most absorbent. This procedure was completed three times. Upon completion, in each trial, the sawdust absorbed the most oil. In conclusion, my hypothesis was incorrect.

Project Number: MES043

Grade: 8

Title: What affects stream life?

Abstract: I chose this experiment because I like finding creatures in streams. I hoped to show what affects the amount of life in streams. I chose five streams: a STP stream, Mike Fink's Rune, Tevebaugh Run, Big Sewickley Creek, and Connoquenessing Creek. I did stream studies and took samples from each stream. I found the pH, fecal coliform, and watershed. Tevebaugh had the most creatures and lowest coliform. STP had the least creatures and highest coliform. I found that coliform was important and that watershed wasn't important to the amount of life. I couldn't draw conclusions on pH.

Project Number: MES044

Grade: 8

Title: Suds and Seeds

Abstract: The purpose of my experiment is to see how hand soap affects plants.
1. Fill 20 4 x 4 plastic pots with potting soil. 2. Plant seeds in the pots (use measuring stick to determine). 3. Water 10 of the plants with 60 mL regular water, and the other with 30 L of hand soap and 30 mL of regular. 4. Do every other day for three weeks, checking height of each plant in centimeters. 5. Calculate results.

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

Project Number: MES045

Grade: 8

Title: Composting Cooked & Raw Potatoes

Abstract: The purpose of this experiment was to find out if cooked potatoes decomposed faster than raw potatoes. My procedure was to cut 20 cubes from the same potato and cook half of them and watch their decomposition. After eight days, the decomposed average surface area of the cooked potatoes was 41.6mm², and the decomposed average surface area of the raw potatoes was 17.7mm². In conclusion, the cooked potatoes decomposed about 2.35 times more than the raw potatoes. With this information, people who normally don't throw their cooked vegetables into the compost now know they can.

Project Number: MES046

Grade: 7

Title: Making Waves

Abstract: I'm doing my project on oceans because I wanted to see if the wind and ocean currents affected the way the waves were form and how much power it has. In my hypothesis I predicted that the basin that used the hair blower would make the water level rise. After I tested my project my hypothesis turned out to be correct. This is why I did my project.

Project Number: MES047

Grade: 8

Title: What Type of Music Best Affects Plant Growth?

Abstract: The purpose of my experiment was to find how music affects plant growth. For this experiment, I measured the groups of plants each day before playing music, then played music for 1 hour a day for 16 days after the plants sprouted. (The plants I used were Wisconsin Fast Plants.) I had 4 groups of plants, rock, hip hop, classical, and controlled. My averages were 3.54cm for controlled, 2.49cm for rock, 2.95cm for classical, and 2.23cm for hip hop. During this experiment I found that music actually stunts the growth of the plant, and the controlled group grew best.

Project Number: MES048

Grade: 7

Title: Stink Bug Repellent

Abstract: Stink bugs are small, flying bugs that eat crops and let off unpleasant smells. In my experiment I tested three different stink bug repellents, mint leaves, soapy water, and vinegar, to see which was most effective. I chose this project because people were being infested with these bugs in their homes. My experiment setup had three lanes, and at the end of each lane was the repellent. On the other side of the lane was water, the control. After 15 minutes I measured the distance the stinkbug was away from the repellent and concluded soapy water worked best.

Project Number: MES049

Grade: 8

Title: Save Aquatics

Abstract: The purpose of my experiment was to see how we can save aquatic organisms and give them a safe environment with abandoned mine drainage. This project goes into how the

EARTH / SPACE / ENVIRONMENT- INTERMEDIATE (7TH-8TH GRADE) - MES

process of passive treatment works. Increasing the pH level, decreasing the iron, and increasing the alkalinity level would allow for a suitable place for aquatic life to thrive. Environmentalists and biologists would be interested in the results of this experiment.

Project Number: MES050

Grade: 8

Title: Plant growth in varied pots

Abstract: Purpose of doing this experiment: Find out how to make basil grow the fastest. Procedures: 1. Plant basil in shallow trays and wait for them to become strong enough to transfer into the three different kinds of pots. 2. When basil is fully grown transfer them into three white, clear, and black pots (three black pots, three white pots, three clear pots.) 3. Make observations of growth of plants in each pot. 4. Analyze the information gathered from the experiment. 5. Conclude based on results. * Conclusion has not been reached, still collecting data.

Project Number: MES051

Grade: 7

Title: Oil Spill

Abstract: The purpose of my experiment was to see which material out of toilet paper, napkins, and paper towels, can best absorb the oil. I will put water in a container and add vegetable oil to it. Then I will use different materials and use them to clean up the oil. I will keep track of how many of each material it takes. The data was that the paper towels had an average of 42, toilet paper had the average of 129 and the napkins had an average of 97. My conclusion was that paper towels were the best material to use because it had the least amount that was needed to clean up the oil.

Project Number: MES052

Grade: 7

Title: Can Rocks Clean Water?

Abstract: The purpose was to determine which rock(s) purify water of organic chemicals best. I tested limestone, granite, river rocks, shale, and sand and gravel. I used grape juice for an organic chemical. I measured the color of the solution to determine concentration after the rocks sat in the solution for five days. I also tested the rocks for clay content with methylene blue. Sand and gravel had the highest clay content, but shale best reduced the juice concentration. My hypothesis that rock with the highest clay content would decontaminate water best was incorrect. The most porous rock decontaminated water best.

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

Project Number: MER001

Grade: 8

Title: Enviropower

Abstract: A windmill's efficiency is determined by the blade material, shape, and its position into the wind this experiment will test the effect of a windmill's blade angle on its energy production. Four trials were performed for each of three different (5, 20, 45 degree) blade angles. A set of three blades were constructed. A box structure was made out of K'Nex. Although the same set of blades was used for each trial, the angle was changed to correspond with the angle being tested. Three blades and one hub were assembled to create a rotor. A windmill rotor was mounted to a broom handle and secured by zip ties. The windmill assembly was then inserted into a water filled 5 gallon jug. Four trials for each of the three angles were completed. Each trial was consistently tested at a distance of eight feet from the electric fan. The fan was on low speed. The number of rotations per minute will be recorded. This process was repeated each of the three blade angles tested. Data collected through all twelve trials was graphed for an easy visual analysis. Initially, the experimenter expected the 45 degree angle to outperform the other two angles. Upon completing the experiment, the data ended up proving otherwise. Although the 5 and 45 degree blade angles produced power, this experiment found them produces significantly less power than the 20 degree blade angle.

Project Number: MER002

Grade: 8

Title: Mechanical Advantages of a Bike

Abstract: What I did was test how the gear ratio of a bicycle affected the top speed. I swapped out the front gear which is found in the middle of the bicycle with a larger and smaller than what was on the bike. In my experiment I have found that If the gear in the front of the bicycle was larger it made the bike have a higher top speed but slower acceleration, also a smaller frontal gear the lower top speed but faster acceleration to the top speed.

Project Number: MER003

Grade: 7

Title: Soundproof Solutions

Abstract: People around the world have hectic lives and want nothing with their noisy environments. The main idea for Soundproofing Solutions is to find cheap, effective materials to make rooms soundproof. In this experiment, I am going to test 8 common materials with 3 trials for each. I am going to use a DB meter to measure the sound volume. My hypothesis is that the mass-loaded-vinyl (MLV) will be the most soundproof material because it is used for recording studios. The soundproofing solution can be used for improving living qualities of homes, offices, airports, etc.

Project Number: MER004

Grade: 8

Title: Building a Tesla Coil

Abstract: My project has more than one purpose. My first purpose shall be to construct a Tesla Coil. Then my secondary objective is to actually find some use for the Tesla Coil, and at the same time, witness an amazing light show also. My procedures shall be to make sure everything is safe (since the project includes hazardous risks). Then I shall construct it, and search for some beneficial use. I shall get almost all of my data from the internet, such as websites and instructional videos. This is my Abstract which includes the main idea of my project.

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

Project Number: MER005

Grade: 8

Title: Wind Tunnel

Abstract: The purpose of this project was to test the aerodynamics of various shapes. A small wind tunnel was created to conduct the tests of shapes in terms of their ability to resist movement due to drag. This experiment could be used by engineers in the production of any mode of transportation.

Project Number: MER006

Grade: 8

Title: Solar Powered Car

Abstract: The purpose of this project was to examine the effectiveness of using solar power for the propulsion of a car. A small model was created using a simple solar cell and electric motor. Angles of light incidence were varied in attempts to measure the most effective angle of sunlight. Light rays exposed at 90 degrees from the panel generated the most electricity.

Project Number: MER007

Grade: 8

Title: Go With the Flow

Abstract: The purpose of my project was to find out if allowing a wind turbine to pivot to the wind will affect its efficiency. To test this I used a homemade wind turbine and a fan to simulate wind. To see the results I used a voltmeter to observe millivolts generated. The turbine was tested at 31 different angles while the fan was placed at 3 angles. The best performing angle was 90° with a head on air source. However slight angles such as 85° worked as efficiently. My conclusion is that a slight angle or head on angle is most efficient.

Project Number: MER008

Grade: 7

Title: Deasy Bridges Falling Down

Abstract: In my experiment I studied the difference between how much weight a 4-bay truss could hold and how much weight a 6-bay truss could hold. I found that the 4-bay truss could hold more weight. I think that the 4-bay truss held more weight due to it being more compact where as the 6-bay truss was too long and couldn't distribute the weight evenly because too much weight was put in one spot.

Project Number: MER009

Grade: 7

Title: The Power to Make the Loop

Abstract: The purpose of this experiment was to see how much kinetic energy is needed in order for a marble to make a 360 degree loop. Using marbles, Hot Wheels track, and a tape measure, I constructed a track with a loop. While adjusting the track, I recorded the performance of the marble and the loop. I continued this procedure ten times to obtain an accurate record. The marble completed the loop starting at 72.7 cm. and was no longer able to make the loop at 38.1 cm. My hypothesis was proven to be accurate.

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

Project Number: MER010

Grade: 8

Title: Temperatures Affecting Windmills

Abstract: The purpose of my experiment is to build a model windmill generator and determine if the temperature of the wind affects how quickly it spins. If heat in the air is increased, then a windmill's blades move at a faster rate. If the heat in the air is decreased, then the windmill's blades move at a slower rate. I plan to test this by using a blow dryer on hot and cold settings and counting how many times the blades rotate for each temperature.

Project Number: MER011

Grade: 7

Title: Dome Sweet Dome

Abstract: The purpose of my project was to determine how much weight different shapes of domes can hold. The procedures that I used were toothpicks, dots, and 3 different shapes of domes: dome, half-dome, and arch. My results were the dome held 7.5 books, the half-dome held 9 books, and the arch held 6.5 books. My conclusion I think if I build different shapes with toothpicks then they will hold different amounts of weight. I think that the arch will hold the most weight, then the half dome, and last the full dome. I learned that the horseshoe arch is based on the semicircular arch. Next time I would do different shapes of domes.

Project Number: MER012

Grade: 8

Title: Effect of Water On Concrete

Abstract: Concrete is a product that doesn't negatively affect the environment. It's used in many ways in society. This experiment was to determine if adding more water content to concrete effects its strength. The hypothesis: concrete mixture with least amount of water is strongest. Water, cement, and sand were measured 0.6, 0.55, 0.5, 0.45, 0.4 water-cement ratios, then mixtures were poured into 5 cm x 5 cm test cubes, cubes set for 24 hours and moved to limewater tank. Two cubes were broken from each group every 3,7, and 28 days and strength was measured using a compression machine. Results: 0.4 ratio mixture was strongest, 0.6 ratio mixture was weakest. The hypothesis was supported by investigation.

Project Number: MER013

Grade: 8

Title: The Effect of Heat on Diodes

Abstract: I selected my project because I was interested in using electronics to test my hypothesis. To carry out my experiment, I connected the basic electrical circuit, calibrated my diode, and started testing in my oven by heating it up to a certain temperature and recording the temperature and voltage. In the end, it seemed that temperature did have some effect on voltage. The voltage was always around 48 V/mA, except for my lowest variable, 171 degrees Celsius. The data didn't support my hypothesis, but I expected that. To further my experiment, I'd keep testing for data to support my findings.

Project Number: MER014

Grade: 8

Title: Focus Flyer

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

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

Project Number: MER015

Grade: 7

Title: Maglev vs. Wheels

Abstract: The purpose of this experiment is to test if a maglev train or a conventional wheeled train will travel farther when the same amount of force is applied to each. Two model train cars are built out of identical materials; one fitted with wheels, and the other with magnets. Each model is tested on its own track, one built with conventional rails, and the other with magnets. A pendulum is used to apply force to each model, and the distance each car travels is measured. Data collection is ongoing, and will be presented with my conclusion at my fair presentation.

Project Number: MER016

Grade: 7

Title: Testing the Ratio of Sand to Cement in Concrete

Abstract: The purpose of this investigation is to find out if adding sand to cement makes the cement strong. I chose this investigation because I want to be an architect and this process is important in making strong structures. To conduct this investigation I mixed varied combinations of sand and cement, poured them into molds, and then tested the strength of each combination using weights. After running trials I found that the combination of 50% sand and 50% cement was the strongest. All of my data will be available at my display on Fair Day.

Project Number: MER017

Grade: 8

Title: Strength of Bridges

Abstract: What I did with my project was to construct three bridges from popsicle sticks and see how much each would flex when I added 1 1/4, 2 1/2, 3 3/4, and 5 pound barbell weights to them. I made the three bridges, a beam, arch, and truss bridge. I took each bridge and placed it spanning over two plastic five gallon buckets, put the dial indicator under the chosen bridge, put each of the weights increments on the bridge, one at a time, recorded my data, then repeated the same process for the arch and truss bridge.

Project Number: MER018

Grade: 8

Title: Leonardo DaVinci's Aerial Screw

Abstract: The purpose of this project was to create working models of Leonardo Da Vinci's famous helicopter or aerial screw. Using Da Vinci's plans, several models were constructed in an attempt to test lift capability. Models were created at roughly 1:10 ratio to the original sketches. With some modifications, several variants of Da Vinci's aerial screw achieved minimal lift.

Project Number: MER019

Grade: 8

Title: Design and efficiency of an airplane's power usage

Abstract: My purpose for doing this project was to figure out which propeller design created the most voltage therefore being the most efficient. I bought 3 different types of blades and 3 different motors. I then picked up a volt meter from my teacher to check for the amount of

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

voltage. I tested by putting the propellers (broad and curved, broad, and curvy. I tested and came to my conclusion that blade design of fat and curvy created the most volts

Project Number: MER020

Grade: 8

Title: Will a solar powered camera system outlast a battery powered system?

Abstract: The purpose of this experiment is to see whether or not the solar panels would be worth putting on your helicopter. I have not finished experimentation yet but the procedure I plan to use is as follows. 1. do 3 flights with no solar panels. 2. consult timer. 3. find average transmission time with no panels 4. fit panels 5. do 3 flights with the solar apparatus 6. consult timer 7. average time with panels 8. record results. I do not have any results currently. I expect that the conclusion will be that the solar panels will be worth putting on your helicopter so the camera system does not drain off your flight battery or have to add the weight of a second battery.

Project Number: MER022

Grade: 8

Title: Shak'em Loose Model 6000

Abstract: My project will demonstrate an innovative portable device for mixing powders in liquids. This device is being developed for use as a common kitchen appliance.

Project Number: MER023

Grade: 7

Title: Blade Shape and Output

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

Project Number: MER024

Grade: 7

Title: Can he go all the way?

Abstract: The purpose of my project is to determine how fast a robot goes on different types of floors. I did this topic because I found it interesting and I like to build stuff. It took me a pretty long time to build the robot, but I did it. I used a robot kit to build the robot. The kit had different types of bolts and screw's it was kind of difficult to put together. The kit had instruction on how to build different types of robots, so I decided to build a car robot. The different types of floor that I tested the robot on were tile floor, hardwood floor, and carpet. The speeds of my robot on tile floor averaged 6.63sec. The speeds of my robot on hardwood floor averaged 4.7sec. The robot did not run on carpet so its data is zero. That means my hypothesis was wrong I thought that the robot would go faster on hardwood, but the robot went faster on tile.

Project Number: MER025

Grade: 8

Title: Mean Green Driving Machine

Abstract: In my project I tested which car would be faster, solar panel or hydrogen. I hypothesized that the solar panel car would go much faster because it was lighter than the hydrogen car. The way I did this was by going out on my basketball court and measuring 15 feet and having my assistant hold the stop watch while I raced the cars. The reason I did my

ENGINEERING / ROBOTICS - INTERMEDIATE (7TH-8TH GRADE) - MER

experiment was because I was always fascinated with how car companies were trying to make solar panel cars and I decided to do my science fair project on it. My hypothesis matched my conclusion.

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MMH001

Grade: 8

Title: High Pressur Play

Abstract: The stress level is elevated while playing different kinds of mentally challenging video games. Three different game types are selected for one human subject to play. These games include car racing, adventure and fight/ combat. A human subject will have his blood pressure and pulse rate taken at rest, and at the thirty minutes intervals for each play of one hour duration. The data will be recorded in table as well as in a graph form. This study will prove that combat video games are more stressful and hence will elevate the blood pressure and pulse rate the most.

Project Number: MMH002

Grade: 8

Title: Lungs of All Ages

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

Project Number: MMH003

Grade: 8

Title: You Really Want to Wear That Fabric?

Abstract: Bamboo fabrics have been increasing in popularity recently. Clothing companies claim that they are antibacterial. They say this because of a substance that the Bamboo plant itself contains (Bamboo Kun). I tested to see if these claims were correct. I first conducted a disc diffusion method, and found that the bacteria were not affected by the fabrics. I then pipetted bacteria onto fabrics, and after one day counted the bacterial colonies from samplings. There was no significant difference in the colony counts on the Bamboo compared to Cotton fabrics (control). I disproved the claims. Bamboo fabrics are not antibacterial.

Project Number: MMH004

Grade: 8

Title: How do different materials affect bacteria growth?

Abstract: The purpose of this investigation is to determine which type of countertop material is least resistant to bacteria growth. I chose this investigation because I wanted to be sure that the surfaces in my home are bacteria resistant so my family will stay healthy. To conduct this investigation I will clean the surface samples I am using, test them for bacteria, grow bacteria on them, then test them again and compare the results. I have not finished collecting data so I cannot report on results at this time. My final **Abstract** will be available at my exhibit on Fair Day.

Project Number: MMH005

Grade: 8

Title: The Doctor Heard What?

Abstract: This project was chosen because it sounded interesting and when I grow up I am going to pursue a career in the medical and health field. This gives doctors information on how clothing affects the ability to hear a patient's heartbeat. The hypothesis was supported and it is that the doctors will be able to hear the heartbeat better through lighter materials. To find results in this project one would need to have a

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

light and heavy material. Put the stethoscope up to the decibel meter which is used on the iPhone. Turn the iPod radio to volume 17, which one would then put the material that is being tested up to the iHome and put the stethoscope on the material, with the decibel meter by the ear buds on the stethoscope. The data found that the average was negative ten decibels and the lighter material was negative seven decibels. The real- life situation and connection is to help doctors understand how it is better to listen to the heartbeat through the different materials.

Project Number: MMH006

Grade: 8

Title: Rainbow Manie (Can you see it?)

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

Project Number: MMH007

Grade: 7

Title: Most Antibacterial Mouthwash

Abstract: This project was chosen to find out how to help society clean their mouths better. To conduct this experiment, spread mouth bacteria over an agar plate and poke four holes in the agar plate. Squirt a mouthwash brand into the holes and seal the plate shut with tape. Place the plate in an incubator and record results 24 hours. The data collected showed that Listerine did the best and that mouthwash loses its effectiveness over 24 hours. The conclusion supported the hypothesis because Listerine contained the most alcohol, so it did the best.

Project Number: MMH008

Grade: 8

Title: Breathe In, Breathe Out

Abstract: The purpose of this project was to learn more about how the body turns oxygen into carbon dioxide and if the different breathing rates produce different levels of carbon dioxide. Step one of the procedure was to add 15 drops of ph test solution to test bottle one. Step two was to pour the mixture into the homemade respirometer and pour $\frac{1}{4}$ full into test bottle two for a control. Step three was to drill holes into the respirometer, then place the inlet and outlet tubes in the holes and seal with modeling clay. Then you start the procedure one which is breathing while resting (aireate after each trial with the aquarium pump. The results were on trial one the ph turned to 6.0 in 57.5 seconds. Trial 2 lasted 1 min. and 16 seconds and the ph was 6.2. Trial 3 had a ph of 6.3 and it lasted 57 seconds. The second procedure was breathing while exercising. Trial one was 30 seconds long with a ph of 6.2. Trial 2 was a ph6.3 and it lasted 29 seconds. Trial 3 lasted 31 seconds with a ph of 6.2. Procedure three was breathing into a paper bag for one minute. The results were a ph of 6.2 in 45 seconds. Therefore the data shows that through different levels of breathing, the levels do not seem to change dramatically.

Project Number: MMH009

Grade: 8

Title: Effectiveness-Germicidal Lamps

Abstract: This experiment tested whether distance affects the potency of germicidal lamps. I placed agar plates inside a sanitizing cabinet at following distances from the lamp: 6.5 cm, 17 cm, and 30 cm. Each distance level contained a plate with a "V" construction to block the rays

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

and a plate with a traced "V". I subjected the plates to radiation, placed them in the incubator, and measured them. The amount of bacteria on the plates increased as the distance between the bulb and the plate increased, although the uncovered areas yielded almost no bacteria. The results supported the hypothesis.

Project Number: MMH010

Grade: 8

Title: Damage of Energy Drinks

Abstract: The purpose of this experiment is to see which energy drink is the worst for teeth. For one month the teeth will sit in the energy drinks. The effect of the teeth is the independent variable. The dependent variable is the energy drinks, and the control is the tooth not in energy drink. Once the teeth have sat in the energy drinks for a month, take them out and allow drying. The hypothesis was supported by the data. The teeth turned out to be in bad condition. Monster Drink proved to cause the worse damage to teeth.

Project Number: MMH011

Grade: 8

Title: My Head is Throbbing

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

Project Number: MMH012

Grade: 7

Title: Coffee or Tea

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

Project Number: MMH013

Grade: 8

Title: Comparison of Bacteria on Pre-packaged vs Deli Meats

Abstract: The experimental purpose is whether prepackaged or deli lunchmeat has more bacteria. The control was swabbed with water, 3 plates were swabbed with prepackaged meat, and 3 plates with deli sliced meat. I incubated the plates over 24 and 48 hours and then counted. The average bacteria on prepackaged meat after 24 hours was one; deli sliced meat had 137. After 48 hours prepackaged had 33, deli had 161. The control grew no bacteria. Evidence supports that prepacked meat had less bacteria than deli sliced meat.

Project Number: MMH014

Grade: 7

Title: Dancing With Diabetes

Abstract: My project is called "Dancing With Diabetes". I decided to continue research on my project from last year and see if when I exercise I use less insulin. To test this, I ate every meal of the day repeatedly for each trial. I ate breakfast, snack, lunch, afternoon snack, dinner, and bedtime snack. Along with eating these things, I would dance for 6 hours or do nothing at all. I checked my blood sugar many times within this period of time. I hypothesized that I would use less insulin on the days that I danced. My hypothesis was proven correct.

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MMH015

Grade: 8

Title: Heart Rate and Music

Abstract: The purpose was to determine which type of music (pop, rock, country) affect heart rate the most. Songs representing the three types of music were played to subjects. Their heart rates were measured and recorded before and after listening to the songs. The percents of change in heart rates were calculated. The data was displayed in data tables and bar graph. Listening to the pop song increased the heart rates the most. Listening to the country song actually decreased heart. The pop song had a fastest beat while the country song had the slowest beat.

Project Number: MMH016

Grade: 8

Title: Beauty In Bacteria

Abstract: In the process of completing my science fair experiment, I learned a lot. When you think one thing is going to happen while testing, something else occurs. When I was testing my mascaras for bacteria, I received results that were very different apart. By the time I finished testing, my results stated that it doesn't matter what kind of mascara you buy, because there was no growth besides outside contamination. By conducting this experiment, I learned that a lot of eye problems can be caused by outside bacteria, not from bacteria in mascara.

Project Number: MMH017

Grade: 8

Title: Do You Eat Right 4 Your Type?

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

Project Number: MMH018

Grade: 8

Title: Natural or Traditional Remedies

Abstract: The purpose of this experiment was to determine whether natural or traditional remedies eliminated the most bacteria. The traditional remedy tested was penicillin while the natural remedies were colloidal silver, tea tree oil and grapefruit seed extract. E Coli and Staphylococcus Epidermidis were swabbed on to agar plates and a control was used for two trials. For E Coli, grapefruit seed extract had the largest zone of inhibition while for Staphylococcus Epidermidis, tea tree oil had the largest zone of inhibition. To conclude, the traditional remedy did not work as well as the natural remedies in eliminating the bacteria.

Project Number: MMH019

Grade: 8

Title: The Effects of Soda on Tooth Enamel

Abstract: The purpose of my experiment was to compare the effects of various sodas on tooth enamel. My procedure was to submerge 30 eggshells in 10 different sodas for 3 days, and then calculate the percentage of mass lost. I also compared the soda's acidity to the percentage of mass lost. Sprite did the most damage, and Root Beer the least. Also, the

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

acidities and percentages did not line up. I conclude that all 10 of the sodas cause tooth decay and enamel erosion, but there is no direct correlation between a soda's pH and the damage it causes.

Project Number: MMH020

Grade: 7

Title: Coke or Grape Juice

Abstract: In this experiment, commonly consumed beverages are tested to determine their effect on the numbers of beneficial intestinal bacteria. A non-pathogenic strain of E. Coli was exposed to several dilutions of Coca-Cola and Welch's Grape Juice and grown in a Petri dish overnight. The bacteria were also exposed to Coke-infused and Welch's Grape Juice-infused agar to simulate long term exposure to the variables.

Project Number: MMH021

Grade: 7

Title: The heart rate of a cheerleader

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

Project Number: MMH022

Grade: 7

Title: Energy Drinks and Blood Pressure

Abstract: The purpose was to determine if energy drinks affect blood pressure. Blood pressures of subjects were taken. using a blood pressure cuff both before and after consuming energy drinks. Both blood pressures were recorded, and percents of change were calculated for each subject. The data was displayed in a data table and bar graphs. Energy drink do affect blood pressure. Although the blood pressure for most of the subjects increased, some blood pressures decreased, and some blood pressures remained the same. Energy drinks contain caffeine, which can affect blood pressure.

Project Number: MMH023

Grade: 8

Title: Daily Change of Height in Humans

Abstract: In a magazine article I read they talked about people shrinking in height during the day. I then decided to test this myself. Participants were asked to measure themselves in the morning and in the evening for 3 days in a row. Twenty people participated in my study. They ranged in age from 1 to 80 years old and they were from both genders. Three data points were identified as outliers and removed. Results showed that on average people shrunk 0.0011 meters ($p < 1 \times 10^{-6}$). No effects of age, gender, or initial morning height were found.

Project Number: MMH024

Grade: 8

Title: How do Spices Affect Bacteria?

Abstract: Introduction: Spices are common, natural ingredients often used to preserve food. I tested several common spices ability to inhibit bacterial growth. Procedure: I put bacteria (E. coli and S. epidermidis) and the spices on agar plates. I incubated the plates for 24 hours and

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

measured inhibition two times. Data: Turmeric and cayenne pepper inhibited bacterial growth. Cinnamon, garlic, and the water control did not. Conclusions: Turmeric and cayenne have some antibacterial properties. They might be able to be used in place of chemicals for food preservation.

Project Number: MMH025

Grade: 7

Title: Eco-Friendly vs Traditional

Abstract: The purpose is to test environmentally friendly disinfectants against traditional sprays. To conduct this experiment, take an agar plate and make four holes in the plate. Then, place 5 µl of one disinfectant in each hole. Put it in an incubator for 24 hours, record data, replace in the incubator for 24 more hours, and record data. Overall, Lysol inhibited resistance best after 24 and 48 hours, followed by Seventh Generation. Windex did the worst. The conclusion says that Lysol inhibited resistance best. However, I conclude that people should use Seventh Generation because it is effective and more environmentally safe.

Project Number: MMH026

Grade: 8

Title: Is there a difference in vocal range between children and adults and between

Abstract: The purpose of this investigation was to determine whether or not there was a difference in vocal range between adults and children and between genders. The investigator tested the vocal range of each participant 3 times. She then compared the vocal ranges between genders and between adults and children. She concluded that adult women had the greatest vocal range compared to adult men and all children.

Project Number: MMH027

Grade: 8

Title: Cooking Style Affects Vitamin C

Abstract: My research purpose was to determine which cooking method preserves the most Vitamin C content in vegetables. To compare vitamin C content in the various samples obtained from cooking the vegetables, I used a titration method with a vitamin C reagent (dichlorophenolindophenol) containing iodine, potassium iodide, and various starches. When I added my samples of cooked vegetables to the dichlorophenolindophenol, it turned from blue to clear. Steamed vegetables achieved this characteristic change with a mean of 23 drops of vegetable solution, less than with any other cooking method. I have concluded, therefore, that steamed vegetables retain the most Vitamin C.

Project Number: MMH028

Grade: 7

Title: The Race for the Mold

Abstract: This experiment was to determine which multi-grain bread, gluten-free or regular, would mold faster. I have Celiac's disease so I cannot eat anything with gluten. My hypothesis was that my gluten-free bread would mold faster. I cut five pieces of each type of bread into the same size circle, squirted each with water, wrapped each in foil, labeled them, and placed them on the windowsill. I checked them daily and recorded the mold in units. At the conclusion of my experiment, gluten-free bread had 58.75 units of mold; regular bread had zero. Gluten-free molded faster proving my hypothesis.

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MMH029

Grade: 7

Title: Where are the Most Germs in the School?

Abstract: The purpose of my experiment is to find where the most germs harbor so we can take action to prevent illnesses. I will swab eight different rooms in my school to see which room has the most germs and bacteria. After I swab I'll put them in Petri dishes filled with agar and examine them under a microscope. As it turns out, the science lab contained the most germs. This was because of the microscope in the science lab which was covered in germs. I found this unusual because bathrooms have an unsanitary reputation.

Project Number: MMH030

Grade: 7

Title: Get in the Zone!

Abstract: Sterile paper discs were soaked in 20 mL of 2 generic, 2 green as well as 1 multi-surface cleaner claiming to be antimicrobial and 1 multi-purpose cleaner not claiming to be antimicrobial for 2 minutes before being removed and allowed to drip for 2 minutes before being placed on the middle of each quadrant before being placed in an incubator set at 37°C for 48 hours. After 48 hours the plates were removed and the zone of inhibition was read. The Generic Ultra Oxygen cleaner created the greatest zone of inhibition but was also the most costly product per mL.

Project Number: MMH031

Grade: 7

Title: Are You In Pain?

Abstract: Thousands of people use pain medications every day, but most are using these medications incorrectly. I did this science project to provide some valuable information to consumers so that they can choose the appropriate pain medications. From my experimental results, I found out that aspirin dissolves the fastest followed by acetaminophen, ibuprofen, and then naproxen. I also found out that, for fast pain relief, tablets may be a better choice because they dissolve faster when compared to caplets and gel caps. But, naproxen can give you medication for an extended period of time because it dissolves slower.

Project Number: MMH032

Grade: 8

Title: Hand Sanitizer Effectiveness

Abstract: Hand Sanitizers are alternatives to washing hands with soap and water. This experiment was intended to discover which hand sanitizer works the best. Paper discs each soaked with 1 of 10 different hand sanitizers and 1 control with sterile water were placed on 99 agar plates streaked with one type of the following bacteria: Escherichia coli, Staphylococcus epidermidis, or Micrococcus luteus. Three trials were conducted for each type of bacteria. The 99 agar plates were placed in the incubator for 72 hours at 37° Celsius. Plates were removed, zones of inhibition were measured, and the results of the three trials were averaged. It was determined that Lysol Healthy Touch Foaming best inhibited bacterial growth. The Lysol hand sanitizer was the only product to contain the active ingredient isopropyl alcohol. Future work is planned to test more strains of bacteria.

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MMH033

Grade: 8

Title: Tooth Enamel Stains

Abstract: The purpose of my experiment is to determine which beverages, Coca-Cola, Chocolate Milk, Grape juice, coffee, and tea cause the darkest stain on enamel. All eggs are of the same brand and membranes are taken out. Set 1 includes 3 eggs set to soak for 48 hrs in each drink in containers all the same size. After soaking, take egg shells out and rinse and dry. After the eggs are dried, with controlled light, height, and position of camera, take picture of each egg. On the computer, calculate the RGB. The lesser the value of R+G+B is, the darker the stain. Set 2: 96 hours, Set 3: 144 hours total soaked. I concluded that Grape, Coca-Cola, and Coffee produce the darkest stains.

Project Number: MMH034

Grade: 8

Title: Decomposition Rates of Food

Abstract: In today's society, we are trying to find ways to preserve perishable food. I tried to determine how temperature, conditions, and the bacteria present affects the decomposition rate of food. I combined gelatin and bread into eight equivalent parts and infused each of the mixtures with different combinations of bacteria/mold found on bread and gelatin, left them in different temperatures, and put them in aerobic and anaerobic conditions. The result was that the bacteria present didn't have an effect but the parts left in an aerobic condition and warmer temperature decomposed the fastest.

Project Number: MMH035

Grade: 7

Title: Vinegar - The Panacea of the World?

Abstract: Vinegar – a Panacea! Could it be a cure to the spread of Multi-Drug-Resistant-Bacteria (MDRB)? Hippocrates, the Father of Medicine, prescribed it himself to his patients. I conducted a multiple-phased experiment. I prepared batches of 6 MDRB's, inoculated, plated agar, and waited 24 hours before evaluating the growth inhibitory effect of each agent, namely, water, vinegar, acetic acid(10%), Clorox, Lysol, and Glutaraldehyde. Vinegar (0.4% Acetic Acid) had comparable results to Clorox and Lysol, which were efficacious, yet with high PET(Personal Exposure Toxicity) rates. Glutaraldehyde took 48 hours to become effective. This proves that vinegar is the most safe and efficient agent.

Project Number: MMH036

Grade: 7

Title: Caffeine Attack on Blood Pressure

Abstract: My project is titled Caffeine Attack on Blood Pressure. I chose this experiment because I was interested to see what effect caffeine has on blood pressure. I had each subject per group (Group One is adults and Group Two is children) drink 355 mL of Mountain Dew. I calculated their blood pressure prior to the caffeine intake and after. I hypothesized that the blood pressure would raise more in adults. My hypothesis was proven correct. The systolic raised 3 mmHg (millimeters of Mercury) in adults and children. The diastolic raised 3 mmHg in adults and only 1 mmHg in children.

MEDICINE / HEALTH / MICROBIOLOGY - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MMH037

Grade: 7

Title: Density effect of fruits and vegetables

Abstract: My experiment is if the density of fruits & vegetables effect how healthy it is. I wanted to do this project so people can make healthier choices when choosing what fruits & vegetables to eat. To do this project, I found the nutritional values of fruits & vegetables and I found the density of each. I did this by finding the density of 3 different parts of a fruit & doing that to 3 same fruits & vegetables. I got the most accurate density of each fruit & vegetable. I concluded that density doesn't affect the nutritional value of a fruit & vegetable.

Project Number: MMH038

Grade: 8

Title: Balance and Your Senses: Which Wins?

Abstract: The purpose of this experiment was to see how your five senses affect your sense of balance. The problem was – “How does a blindfold, unpleasant whistle, eating lemonade flavored Kool-Aid powder, inhaling vapor rub through a surgical mask, and dipping a hand into ice cold water, effect one's sense of balance?” and “Out of all five senses, which change will effect one's balance the most?” It was predicted that all of the senses would have some sort of effect on one's ability to balance because three of the five senses have partial control over the equilibrium which is “in charge” of balance.

Project Number: MMH039

Grade: 8

Title: Putting: Is Your Heart Really In It?

Abstract: My project's purpose is to measure stress in golfers while they putt. To experiment, I measured the baseline heart rates of subjects. Then, I measured their heart rates and putting accuracy while they made four putts at: 1 foot (.305 meters), 5 feet (1.525 meters), 10 feet (3.05 meters), and 20 feet (6.1 meters). The data shows that the increase in heart rates is proportional to the increase in the length of putts. The data also reveals that the increase in the length of putts is inversely proportional to the accuracy of putting.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH001

Grade: 8

Title: I'm Cool Like That!

Abstract: In my project "I'm Cool Like That!", I tested to see which type of gas (oxygen, hydrogen, or helium) or regular air would hold the best air pressure in a ball when it is in a cold environment. I hypothesized that the oxygen gas would hold the best air pressure because the particles in the gas are at average speed, and the cool environment would not affect the particles in the oxygen molecules, as it would if they were at a higher speed. When doing my project, I used the gases and placed them inside the balls. After all gases were filled, I used a pressure gauge to adjust the pressure to all be equal. When all of the gases were equal, they were put in a cool environment. After about seven hours the balls were taken out of the freezer and were tested with the pressure gauge. Then the data was recorded. I discovered that the helium gas held the best air pressure because the particles in the gas give a different force of pressure to the ball and it would not affect the drop in pressure as much.

Project Number: MPH002

Grade: 7

Title: Duck Tape vs Packing Tape

Abstract: The purpose of this experiment was to determine which tape—packing tape or duct tape—was stronger. The investigator chose to test the adhesive strength and the tensile strength of both of the tapes. After testing both strength values repeated times with both tapes, the investigator determined that the packing tape had a stronger adhesive strength and a stronger tensile strength than the duct tape.

Project Number: MPH003

Grade: 8

Title: Don't Fret with my Strings

Abstract: The purpose of my project was to determine the frequency of the vibrations of a guitar string as the effective length of the string is changed by fretting it. I tested this by fretting the string and plucking it with a guitar pick. I looked for the difference in the sound as related to the difference in the vibration by using the tuner to measure the Hertz that each string produced. My data was the when I fretted string 1 at 0 it jumped to 430 Hz and at 53, it went to 444 Hz. My conclusion was if I fretted the string, it depend on the fret to determine if it would produce a higher Hertz. My future idea for this topic would be to test other instruments and see if I would get the same results.

Project Number: MPH004

Grade: 7

Title: Heat transfer in microwave ovens

Abstract: The purpose of my experiment is to determine in which type of container water will heat up faster. I will use three different types of containers: glass, porcelain, and plastic. In my experiment, I will collect 500 milliliters of water in each container at room temperature. I will measure and record the temperature of water in the container. Then, I will heat the water for exactly two minutes. After the microwave is stopped, I will immediately check the temperature of the in water in the center of the container. Next, I will repeat the same process with the other containers and record the corresponding values. I will analyze the collected data by comparing the values that were recorded.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH005

Grade: 7

Title: Surface Area vs Water Temperature

Abstract: My experiment is to see if the surface area of a container will affect how hot the water in the container will get. My hypothesis is that containers with the larger surface area will have the highest temperature. I will do this by filling five containers with different surface area with water, and putting them in the microwave for the same time. I will then take them out of the microwave and measure the temperature. My results showed that the smaller the surface area the higher the temperature and the larger the surface area the lower the temperature was.

Project Number: MPH006

Grade: 7

Title: Free Energy From The Sun

Abstract: What can be done to optimize solar panel's electrical output? The project was set up in a sunny area and tested for tilt, position, time of day, coverage, and weather conditions. If solar panels are clear of dust and debris and is at an optimum angle for absorbing the sun's rays it will function at full capacity. The results showed that position, time, and type of day were most important. The dust did not affect the panel as much as debris. In conclusion, a solar panel must be carefully positioned and kept free of debris to function at its best.

Project Number: MPH007

Grade: 7

Title: How Low Can You Bow?

Abstract: My question is: Which metal will bend the most when heated? I hypothesized that copper would bend the most when heated because I found that when metal becomes heated it is easy to bend. Copper is a soft metal even before being heated. First, I cut 4 boards. Then, I nailed them in a square. I placed one rod into the holder. Finally, I hung a weight from the rod and got a measurement. My hypothesis was correct, the heated copper rods bent more than the room temperature rods. If I were to do this experiment again, I would use a different weight.

Project Number: MPH008

Grade: 8

Title: Earth Outlet

Abstract: My project, entitled Earth Outlet, tests the effect of the earth's magnetic field on the voltage outputted by an earth battery. I learned upon research that the orientation and depth at which the metals are driven can affect the voltage, so I decided to put these statements to the test. I first made a prediction based on the rotational speed of the earth, which could contain perpendicular motion needed (Gauss's law). I tested the voltage outputted for all 8 intermediate compass points, both when the anode was 40 cm higher and lower than the cathode (derived mathematically).

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH009

Grade: 7

Title: What Ball Goes Farthest?

Abstract: I did this project because I really like baseball. I hypothesized that the tee ball would go the farthest because the inside is made out of rubber. First I designed a "hitting" apparatus. I got all of the materials and then I built the apparatus. Then I pulled the bat back and let the bat strike the different kinds of balls. I measured the distance each ball traveled for each of the tests. I graphed and analyzed my data. My hypothesis was proven correct.

Project Number: MPH010

Grade: 7

Title: How do you roll?

Abstract: The purpose of my experiment is to determine how the height and length of the rolling ramp will affect how far a marble goes. First I assembled a rolling and launching ramp that could be adjusted to different height levels. I then spread a thick layer of corn starch down in the landing area so the marble would not roll when landing. Next, I adjusted the height of both the launching ramp and rolling ramp to include short, medium and high levels. The marble was rolled down the rolling ramp and off of the launching ramp three times at each height level for accuracy. The distance of the marble was measured in centimeters where it landed in the cornstarch.

Project Number: MPH011

Grade: 8

Title: Light Bright

Abstract: The purpose of this experiment was to examine the different amount of energy given off by different colors (wavelengths) of light. A solar cell conducted to a multimeter was exposed to light bulbs of varying colors ranging from red to green. The voltage and current given off from the solar panel was used to measure the best type of light for possible power sources.

Project Number: MPH012

Grade: 7

Title: That's not the Color I Bought

Abstract: Two warm, cool, and office fluorescent lights were purchased from Lowes, as well as a shop light 8 different colored 100% cotton swatches of fabric were purchased from the local fabric store. A photo spectrometer is set up to calculate the amount of transmittance of color from the light to the color of fabric. Results will then be interpreted and recorded.

Project Number: MPH013

Grade: 7

Title: Friction Addiction

Abstract: My project is to see out of 10 materials which one has the greatest static friction threshold. The materials were fine, medium, coarse sandpaper, tissue paper, wooden block, plastic wrap, magazine cover, terry cloth, newspaper, and a paper towel. I hypothesized that the rough sandpaper would have the greatest static friction threshold. To do my project I made a wooden ramp with a protractor. I wrapped a wooden block with the different materials. Then I would put the block with the wrapped material on the ramp and measure the angle the

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

blocked stayed on the ramp until it started to slide. At the end of the experiment, I realized my hypothesis was correct.

Project Number: MPH014

Grade: 7

Title: The Energy Usage of Light Bulbs

Abstract: This investigation was conducted to determine which light bulbs are the most energy efficient. Three kinds of light bulbs were tested: incandescent, fluorescent, and LED. Three brands of each bulb were used in this investigation for a total of nine different bulbs. It was hypothesized that the Sylvania LED light bulbs would use the least amount of energy. I tested the energy efficiency measuring in LUX per watt. LUX measures the amount of light produced. Wattage used by the light bulbs was tested and recorded. Each light bulb was tested 3 times for 3 trials. An average of all 3 trials showed that the EcoSmart LED light bulbs were the most energy efficient. Over all, LED's use the least amount of energy and also last about 50 times as long. Analyzing the cost per bulb, it was found that with LED's, you save money over time even if they might cost more initially.

Project Number: MPH015

Grade: 8

Title: Distribution of Electricity

Abstract: My experiment was to determine which brand of model track had the most even distribution of electricity. I assembled five brands of track, each in an oval layout, using eight curved and four straight pieces of track. I used a locomotive to pull a voltmeter car. I had four data points in which I measured and recorded the volts for each brand. I dismantled the layout and repeated three more times. The track with the spring loaded connectors and nickel rail had the best distribution and the track with the manually placed pins had the worst distribution.

Project Number: MPH016

Grade: 7

Title: Wire Effectiveness

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

Project Number: MPH017

Grade: 7

Title: Effect of Gravity on Kinetic Energy

Abstract: The purpose was to determine if height affected how far the marble traveled down a chute. A chute with a loop was constructed using foam insulation pipe. The height of the chute was changed from 50 cm to 75 cm to 100 cm. Marbles were dropped down the chute at each of the heights. The numbers of times that the marbles completed the loop were measured and recorded. The data was displayed in a data table and bar graph. Most completions were accomplished using the height of 100 cm because this height provided the most kinetic energy.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH018

Grade: 8

Title: Don't Let the Line Break When Fishing

Abstract: The strength of various fishing line (inexpensive, moderate, and expensive) was evaluated using a range of weights. A second phase included the impact of water temperature on the tensile strength.

Project Number: MPH019

Grade: 8

Title: High Flying Fun

Abstract: I performed this project because I wanted to find out how different adjustments to a catapult affect its ability to launch a projectile. I wanted to see what adjustments would enable the catapult to launch projectiles farther. I am going to perform this experiment inside. I will make changes to the catapult as I launch my projectiles. I discovered that with higher tension and a shorter stopping angle the projectile will be launched farther. If I did this again, I would hold down the basket down for the same amount of time, and I would use more stopping angles.

Project Number: MPH020

Grade: 7

Title: Ping Pong Catapult

Abstract: The purpose of this experiment was to see if a higher angle would launch a ping pong ball farther than a lower angle. To conduct this experiment I have to make a torsion catapult and find the angles 45, 55, 65, 75, and 90 degrees and launch the ping pong balls. The results of the experiment showed that the angle of 45 degrees had launched the ball the farthest at around 3 meters. 65 degrees was around 2.5 meters. 55 degrees was lower than 65 but it launches it at around 2.5 meters. 75 degrees launched at around 2 meters. 90 degrees was the lowest at around 1 meter. The results show that my hypothesis should be accepted because the lower angle launched the ball farther. It also is because the launch arm is being stopped and is releasing the ball farther.

Project Number: MPH021

Grade: 8

Title: Elastic Limits - Heating Affects on a Rubber Band

Abstract: I did my experiment to figure out the elasticity of rubber bands at different temperatures. Heat each rubber band for one hour. Watch until they are heated accordingly hang a cup holding 150 pennies over a table. Repeat it . Record the rubber bands. Measurements place in a bar graph. Rubber band data: 20degrees-4 1/2 inches, 40degrees-4 3/4 inches, 70degrees-6 inches, 95degrees-7 inches, Conclusion: The rubber band that was heated the most stretched the farthest.

Project Number: MPH022

Grade: 8

Title: Rubber Band Elasticity and Temperature

Abstract: My goal of this project is to investigate how the restoring force of a rubber band varies with temperature. My hypothesis is that the temperature is going to change with how big the weight is and how much water you put in. My procedure is this project. • Do your background research so that you are knowledgeable about the terms, concepts, and

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

questions, above. • Heat a pot of water to boiling on the stovetop. With the help of an adult, carefully pour the boiling water into the graduated cylinder. • using the scissors cut one rubber band so that it is a straight ribbon rather than a circle. • Tie one end of the rubber band to the middle of the skewer, and the other end to the hook on the steel weight. • gently, being careful not to burn yourself on the hot water or steam, lower the weight and rubber band into the graduated cylinder. Rest the skewer across the opening of the graduated cylinder to prevent the whole thing from falling inside. Use putty or play dough to secure the skewer to the edges of the graduated cylinder. Figure 1 below shows a diagram of the experimental setup. My bibliographies are 1.<http://www.pslc.ws/macrog/kidsmac/> 2<http://www.chemheritage.org/EducationalServices/FACES/poly/readings/nat.htm>. 3<http://www.chemheritage.org>4<http://www.newton.dep.anl.gov/askasci/phy00/phy00525.htm>5. <http://nces.ed.gov/nceskids/CreateAGraph/default.aspx>. the focus of the project is to see if temperature effects the elasticity of the rubber bands

Project Number: MPH023

Grade: 7

Title: Touch Screen Technology and Contact Interference

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

Project Number: MPH024

Grade: 7

Title: Gone With the Wind

Abstract: Two Tom Drums were taken apart and the holes were covered with duct tape. They were set on a table and a poster board was taped over a small gap between the drums. A small fan was placed inside this wind tunnel and a large fan was placed facing into the tunnel. An AC voltmeter was connected to the small fan's plug and the large fan was turned onto its three speeds to turn the small fan's blades and record voltage. An anemometer was then placed in front of and behind the wind tunnel to determine wind speed.

Project Number: MPH025

Grade: 8

Title: Light the Way

Abstract: My question was what would happen if more than one colored filter was placed in front of a light and then dispersed into a color spectrum. My hypothesis was that the secondary color alone would be present. When I began my project I started by taping a white sheet of paper to the wall and place the overhead projector perpendicular to that wall. I overlapped two of the three filters and placed it over the Fresnel lens. While holding the diffraction grating over the condenser lens I observed the spectrum and recorded which colors were visible. After my first trial I used the other two filter combinations for two other trials. In conclusion my hypothesis was incorrect due to several mistakes.

Project Number: MPH026

Grade: 8

Title: The Effect of Shampoo on the Tensile Strength of Hair

Abstract: I selected the topic because I was interested in how strong hair is and if modern shampoo will affect the hair's tensile strength. I hoped to prove, that different brands of shampoo will affect the hair's tensile strength. The procedures I used was first to gather all the materials, wash the hair, then test the tensile strength and gather data. The control samples

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

were the strongest by far. Pantene Pro-V had the weakest tensile strength. Therefore, my hypothesis did not support my data. For more accurate results, I would take the hair from the same area on the head.

Project Number: MPH028

Grade: 8

Title: Can Music Paint?

Abstract: The purpose of this experiment was to see if the vibrations from music could cause paint to move? Additionally, what genre of music causes the most motion? It was predicted that rock music would cause paint to move the most because of its strong vibrations. Physicists, Chemists, and Artists would be interested in the results of this experiment.

Project Number: MPH029

Grade: 7

Title: Weight Lifting for Yarn

Abstract: My project's purpose is to see why different things are sewn out of different yarns. I had four different types of yarn: cotton, acrylic, wool, and a blend of bamboo and wool. I cut 11 pieces for each type of yarn, making the total 44 pieces. Each piece had a 5cm loop at one end and was untouched on the other end. The length of each piece was 30cm, including the length of the loop. I hung weights, 500 and 1000g, and did one test for each of the pieces. I recorded the weights and took the average. The natural yarns were weaker than the man-made ones.

Project Number: MPH030

Grade: 8

Title: Swing Driver Swing

Abstract: The purpose of this project is to test whether or not a wooden driver can affect your swing compared to a metal driver. The prediction of this test is that different drivers cannot affect your swing. Because once you learn how to swing a golf club correctly, you should be able to keep it at the same rate. As the volunteers swung the clubs they were given, the metal driver was lighter to use, and so they swung faster. Their was just enough weight difference to throw off the golfer.

Project Number: MPH031

Grade: 8

Title: Going the Distance

Abstract: I chose this experiment because I am interested in how the military chooses to shoot a projectile. My question is, "Which angle results in the greatest distance for a projectile"? I built a launcher that adjusts to different angles from 15 degrees to 70 degrees. I then shot ball bearings from it, and measured the distances. My hypothesis of 45 degrees was supported by my results. My results show that 45 degrees produced the farthest distance. These results can also apply to punting a football. In future experiments, I could build different types of launchers and shoot different projectiles.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH032

Grade: 8

Title: Diet Soda Eruption

Abstract: Purpose: to see which candy produces the most explosions with soda. Procedure: Place each type of candy into a 2 liter container full of diet soda and measure height of reaction. Data: Icebreakers: 29.5 cm, Mentos: 44.3 cm, AirHeads: 23.5 cm. Conclusion: Candies with more surface area produced more reaction.

Project Number: MPH033

Grade: 8

Title: The Pool is Cool ... Or Is It?

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

Project Number: MPH034

Grade: 7

Title: Gone Flying

Abstract: The purpose of this science project was to find out if the size of a paper airplane affects the distance it travels through the air. The procedures used included: A) Creating a data table to record each plane's flight distance. B) Making three paper airplanes of varying sizes (small, medium and large). C) Throwing the paper airplanes each 10 times. D) Recording the distances. E) Figuring an average flight distance for each plane. The averages made it possible to correct the variations in force that may have occurred as each plane was thrown. The project results showed that the large plane flew 111.7", the medium plane flew 104.7", and the smallest plane flew 101.5". In conclusion, the drag affected the largest plane less and the lift was greater because of the larger wing size. The conclusion of this project can be applied to real life. If a frisbee was wanted for long distance, it could be determined from the results of this project, that the larger the frisbee, the longer the distance it would fly.

Project Number: MPH035

Grade: 7

Title: Why Do You Turn When You Punch

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

Project Number: MPH036

Grade: 7

Title: Aerodynamics of a Model Airplane

Abstract: A real airplane and paper/balsa wood airplane share the same aerodynamic logic. This work is intended to study how the three factors wingspan, body length, and the nose affects the flight of model airplanes. All the airplanes were tested on a 30 feet runway, and the speed of each plane was calculated to determine the most efficient plane. The results illustrated that the airplanes that had less difference between the body length and wingspan flew better, without faltering. Future work is planned to find out if the drooped nose of the paper airplane has a role in aerodynamics.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH037

Grade: 7

Title: A Great Insulation For A Day Out

Abstract: What lightweight insulation will keep a frozen water bottle frozen the longest. Take 40 water bottles. Freeze them for 12 hours. Take 40 plastic Ziploc bags. Fill ten bags with 2 liters of cotton balls. Do the same for packing peanuts and sawdust- have an empty bag as control. Put a frozen water bottle in each bag with insulations. Wait 3 hours. Take each water bottle separately out of the bag. Measure how much water is left under the ice with a centimeter ruler. Put bottle back into the bag and let the air out then zip. Wait 3 hours at a time and measure until all ice turns into water. Analyze results.

Project Number: MPH038

Grade: 8

Title: Does Temperature Effect Fuel Cells?

Abstract: A proton exchange membrane (PEM) fuel cell was evaluated under three different temperatures. The amount of work produced and the efficiency of the fuel cell was evaluated under each temperature setting.

Project Number: MPH039

Grade: 8

Title: Fading Light

Abstract: I did this experiment because everyone always says a LED light shines farther and brighter than a normal Flashlight. Procedure: 1st I'll shine the Flashlight at the hill when its dark at 9:00 .Then I'll move back as far as I can until the light goes out . When the light goes out I'll measure the distance of the flashlight by using a 25ft tape measure. After that I'll count up the ft of how far the flashlight shined. 2nd I'll do the same with the led light until it goes out. Then I'll measure how far it shined and measure the distance with a 25ft tape measure. Also I will take pictures of the materials that I used.

Project Number: MPH040

Grade: 7

Title: Not a Drop to Waste

Abstract: The purpose of my experiment was to see if the diameter of a pipe that water was flowing through, changes how much electricity it could produce when it hit a water wheel generator. To find this out I got three different sizes of tubing and hooked them up to a water wheel. First, I hooked up the tubing to the water wheel. Second, I started the water flow through the tube, whenever the water started to spin the water wheel; I recorded how much electricity was generated. I did this with all three sizes of pipe. My hypothesis was correct that the larger the tube the more electricity was generated.

Project Number: MPH041

Grade: 7

Title: The Everlasting Bubble

Abstract: The purpose for this activity is to learn more about bubbles and see what solution would make bubbles last the longest. The solutions tested were dishwashing liquid, water and Corn Syrup, Vinegar, Hand Soap, Regular Bubble solution, Laundry Detergent, or Canola Oil. This researcher blew bubbles with each solution onto a piece of felt and then measure the

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

time the bubble lasted. Each solution was tested a total of five times. According to the data, the Corn Syrup solution lasted the longest with an average of 119.89 seconds. Further analysis of data may show other results.

Project Number: MPH042

Grade: 7

Title: On the Slip

Abstract: How shoes react with force on different floor types.

Project Number: MPH043

Grade: 7

Title: Will The Reaction Equal The Action?

Abstract: This experiment was conducted to see if Newton's third law of motion worked with different weighted rings on a baton. I tested this by getting three different weighted rings and placing them on a baton. I threw the baton to see if the reaction would equal the action. I measured the results by checking to see if the rings went to the baton's ends when thrown. All rings went to the ends, but different events occurred during the process. I accept my hypothesis because all of the rings ended up at the ends of the baton at some point.

Project Number: MPH044

Grade: 8

Title: Mass of a Bag

Abstract: the purpose of my project was to see if there is more weight the farther the marble will go. First i built the trebuchet, then I weighed a marble and three bags of split peas. The marble weighed 12grams and then each bag weighed 125 grams. Next I launched the marble nine times and every three times I added a bag. the shortest was 59.75 inches (it had one bag) and the farthest was 244.75 inches(it had three bags).this is my project and I'm glad you accepted me for the science fair.

Project Number: MPH045

Grade: 8

Title: Swing It Wide

Abstract: My science fair experiment explored the topics of how to make a pendulum swing further, potential and kinetic energy. Potential energy is stored energy. Kinetic energy is energy in motion. To test how to increase a pendulum's potential and kinetic energy, I decided to change the length of the pendulum and also the weight of the pendulum, to see if one or both would affect the pendulum's energy. I constructed a simple pendulum out of a piece of string, a meter stick, two chairs and washer. I measured to period or amount of time it took for the pendulum to swing back and forth once, with the string equal to 100 cm. I first measured the period with one washer attached to the end of the string. I repeated this four times. I then measured the period of the pendulum with 2 washers attached to the end of the pendulum, five times. I then measured the length of the period with 4 washers attached to the end of the pendulum, five times. I repeated these steps with the pendulum string having a length of 50 cm and 25 cm. Regardless of the number of washers attached to the pendulum, the period stayed the same, although a longer pendulum string increased the period. My results were not as expected. Manipulating the weight of the pendulum did not affect how far the pendulum swung. The length of the string affected the period of the pendulum, or how far the pendulum swung.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH046

Grade: 8

Title: Which Frozen Liquid Melts Fastest?

Abstract: The purpose was to determine which frozen liquid (Coke, Sprite, ginger ale, and water) melts the fastest. Ice cubes were made using the four different liquids. The ice cubes were removed from the freezer, and the times of melting were measured and recorded. The data was displayed in a data table and bar graph. The ice cubes of ginger ale melted the fastest; the ice cubes of water melted the slowest. The ice cubes from ginger ale contained air bubbles which affected volume while water contained no air bubbles and, thus, contained the most volume.

Project Number: MPH047

Grade: 7

Title: Lacrosse: How You String Your Head Makes a Difference

Abstract: The purpose for this experiment is to find the best stringing technique for men's lacrosse heads. I built a catapult by welding square tubing and a clay pigeon launcher to eliminate the human element. I tested the control to determine the target placement. The experiment consisted of the control (without shooting strings), one shooting string, two shooting strings, and two shooting strings plus a "V". The results showed that my hypothesis, two shooting strings plus a "V", was not the most accurate stringing technique. The most accurate stringing technique was the one with one shooting string.

Project Number: MPH048

Grade: 7

Title: HOW HIGH WILL IT GO?...

Abstract: My project was testing how different factor including weight, acceleration, wind, and angle would affect the flight of a rocket. I found that some rockets have more of an effect on different factors then others do. For instance one of my rockets called the Blue Ninja flew better straight up as opposed to the Metalizer which flew better with the wind. I concluded that a rockets flight with the factors mentioned in the first sentence do have an effect on flight. This experiment taught me that different factors do affect the flight of a rocket and/or airplane and it can also affect the flight of a ball thrown into the air.

Project Number: MPH049

Grade: 8

Title: A Shocking Breakfast

Abstract: For this year's Science Fair project, I tested static electricity and cereal. I tested this by rubbing a balloon on a wool scarf for approximately 10 seconds. Then I held the balloon above a plate of cereal. The cereal, in turn, 'jumped' to meet and attach to the balloon. The cereal did this because of the static electrons in the balloon and cereal. The lightest cereal worked the best, while the heaviest worked the worst.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH050

Grade: 8

Title: Which substance retains more heat?

Abstract: In my experiment, I'm trying to find the heat retention of three different materials. Heat retention is important in many applications such as nuclear reactors. The three materials I tested were refried beans, milk, and olive oil. I heated each substance to 212F and then let the substance cool in air under identical conditions. I measured the rate at which the temperature decreased to 100F. Additionally I built a calorimeter using Styrofoam cups and measured the amount of heat energy in each substance. The slower the cooling rate the higher the heat retention. In this experiment refried beans had the most heat retention.

Project Number: MPH051

Grade: 8

Title: "R" You Warm? Comparison of Home Insulation Types

Abstract: The purpose of my experiment was to determine how "green" home insulation products compare to other types if they have similar R values. I constructed an insulation testing unit. It was made of an external plywood box and a smaller inner drywall box. A light bulb was used to heat the inner box. I tested the temperature drop of the box when the light bulb was unplugged. I compared fiberglass, cellulose and foam board, all with the same R value. No insulation was the control. I proved that green cellulose insulation products were as effective as other insulation types.

Project Number: MPH052

Grade: 8

Title: Down the Sights

Abstract: The purpose of this experiment was to see if police officers were truly protected against bullets while wearing bullet proof vest. The problem was what type of ammunition can penetrate a level II bullet proof vest? Three different bullets were tested - a .9mm, a 20 gauge, and a .223 rifle round. It was thought that the .223 will be the only bullet that penetrates the vest because of the size and velocity of the bullet. Police Officers, Engineers, and Physicists would be interested in the results of this experiment.

Project Number: MPH053

Grade: 8

Title: Does the Flex of a Hockey Stick Affect the Shot's Velocity

Abstract: chose my topic to help provide stick performance to young hockey players. My procedures were: I measured a 10m distance to the goal line. A radar was set-up behind the goal net. Next, the shooter took 10 shots with each stick. Out of the four sticks tested, the 67 flex performed the best with an average velocity of 65km/h., followed by the 87 flex (64km/h), then the 102 flex (60km/h), and the 52 flex (51km/h). Overall, the 67 flex performed the best. A 14-year-old player could probably use the 67 and 87 flexes depending on their strength and height.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH054

Grade: 7

Title: Electrolytes in Sports Drinks

Abstract: Athletes drink various types of sports drinks to stay hydrated and replace electrolytes that escape their bodies while they sweat. An electrolyte is a chemical that forms electrically charged particles called ions in body fluids. We need ions to carry the energy necessary for many body functions, such as muscle contractions and the transmission of nerve impulses. The more electrolytes a drink contains, the more beneficial it is in replacing ions. This experiment was conducted to discover which sports drink contains the most electrolytes by measuring how well electricity passed through the 8 drinks tested. Electricity is measured in amperes with a multimeter device. Cords linked to the multimeter were placed in each beverage and the ampere reading was recorded in 3 separate trials. An average was then calculated to reveal that Red Bull contained the highest level of electrolytes followed by Gatorade 1 and then Gatorade 2. These results provide valuable information to athletes seeking peak performance and overall good health while training and competing.

Project Number: MPH055

Grade: 7

Title: Nothing Foggy About Car Lights

Abstract: Given that driving conditions often vary, and many accidents occur due to low visibility, it would stand to reason that carmakers would be encouraged to increase visibility to improve their product and prevent injury, benefiting the greater good. It is believed that improved visibility would decrease the rate of accidents or injury, but increased visibility cannot adversely impact other drivers in oncoming traffic. By measuring lumens in directed fog lights, the scientist examined and evaluated the effectiveness of lower directed lighting on automobiles. It is believed that this type of lighting will increase visibility and minimize accidents, while not impacting oncoming drivers. The conclusion should show that this type of directed lighting is both safe for oncoming traffic and especially safer for the driver with the fog lights.

Project Number: MPH056

Grade: 8

Title: Do short people run faster than tall people

Abstract: The problem I am trying to solve is if tall people are faster than short people. The procedures I followed were to get promotion sheets to every participant. Next I measured the height of each participant, and if they were less than 167.7 cm then they were in the short column, and if they were above they were in the tall column. Then I measured 30 meters in the gym. After that I made each participant run 30 meters 3 times, and I recorded the data with a stop-watch.

Project Number: MPH057

Grade: 8

Title: Low Wind Kite Flying

Abstract: This project focused on which kite flew the best in low winds. This researcher constructed 4 different patterns of kites. Then, this researcher set up a fan and tested each kite for flight distances with different temperatures and wind speeds. Each kite was tested starting at a 3.5m distance and every time the kite didn't fly the researcher moved the kite closer to the fan until the kite did fly. The collected data showed that the Diamond kite flew

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

best in low winds. Further analysis of data will include statistical analysis to determine best kite for the variables tested.

Project Number: MPH058

Grade: 8

Title: Never-Lasting Power

Abstract: Many people want to know what brand of battery is the most cost effective, and longest lasting. I tested four brands of batteries, Energizer, Duracell, Enercell, and Rayovac. I tested three trials for flashlights, three trials for motors, and one trial for the radio, while finding voltages with a multimeter. My data showed that Energizer batteries were the most cost effective and longest lasting out of all of the data, with Rayovac ranking second.

Project Number: MPH059

Grade: 7

Title: Effect of Acid on Metal Strength

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

Project Number: MPH060

Grade: 8

Title: The Domino Affect

Abstract: When there is more/less space in between them. Procedure: Set up dominoes with 1/2, 1, and 1 1/2 inch spaces in between them. Tip and time dominoes. Repeat trial 3 times Make a data table. Results: 1/2 in. spaces- .58 seconds, 1 in. spaces- .82 seconds, 1 1/2 in. spaces- 1.55 seconds. Conclusion: The smaller the space, the faster the fall

Project Number: MPH061

Grade: 7

Title: All Blown Up

Abstract: The purpose of this experiment was to see whether helium or exhaled air stayed in the latex balloons the longest. To conduct this experiment I filled the latex balloons with helium and exhaled air and hung the filled balloons in a room temperature area. The experimental results were measured by the circumference (centimeters) of the balloon. The results show that the latex balloons filled with helium deflated before the latex balloons filled with exhaled air. The results indicate that the hypothesis should be accepted because the exhaled air did stay in the latex balloons longer than the helium.

Project Number: MPH062

Grade: 8

Title: Surface Tension

Abstract: Which substance can produce enough surface tension to propel a raft? During this experiment this researcher put a small raft on the surface of water then dropped one of the four substances behind the raft. According to the data, the dish soap was the best; the liquid hand soap was the second best with an average of 9 cm. and 13 sec. The third best was vinegar with an average of 7 cm. and 16 sec. and the worst was the tooth paste with the average of 0cm. and 21 sec. Further analysis of the data may show other differences.

PHYSICS - INTERMEDIATE (7TH-8TH GRADE) - MPH

Project Number: MPH063

Grade: 8

Title: I'll fly away oh glory

Abstract: For my science fair experiment I chose to test how design affects the flight of paper gliders. I chose this to show the world what plane is best. The procedure that I used was simply to launch the planes off of a wooden launcher that I made and to measure their flight distance. After testing I discovered that my "Triple Tail" plane had flown the best and my "No-stabilizer" had flown the worst. Based on this data it is easy for me to see that more stability all in all equals more flight.

TEAM – INTERMEDIATE (7TH-8TH GRADE) - SBS

Project Number: MTM001

Grade: 7

Title: Do Wildlife Prefer Organic or GM Corn?

Abstract: The purpose of our scientific research is to find which type of corn, Genetically Modified (GM) or Certified Organic (CO), Pennsylvania (PA) wildlife prefer. We predicted that they will chose CO corn over GM corn. The results showed that PA wildlife prefer CO corn over GM 4,667 to 4,647 kernels. In conclusion, although not statistically significant, PA wildlife prefers CO corn over GM corn.

Project Number: MTM002

Grade: 7

Title: Ecosystem in a Bottle

Abstract: We made an ecosystem in a bottle by placing soil, rocks, worms and "cosmo" flower seeds. We made this to see if it was possible to create an ecosystem in a plastic bottle. We monitored the bottle to see how long the organisms inside would live. We are still continuing to monitor and observe our ecosystem.

Project Number: MTM003

Grade: 6

Title: Energy Transformation

Abstract: This project will be about turning one type of energy to another. All you have to do other than getting the materials in place is to turn on a fan. Then the fan will blow a ball which will run into a switch, turn a light on. The light bulb will be cracked and light a paper on fire. We're going to go through 5 types of energy.

Project Number: MTM004

Grade: 7

Title: How to Split Atoms with Batteries

Abstract: Our purpose for this experiment was to see if we could split water molecules with only using batteries. Our procedures for doing this was to attach wires to the batteries, and connect the other end of the wire into the water under two plastic cups. We found out that we could see very little but there was a very dramatic difference in the smell of the cups after the experiments. Our data as you can see proved that our hypothesis was correct.

Project Number: MTM006

Grade: 8

Title: Making Energy is a Breeze

Abstract: Our experiment was to determine which type of wind turbine is best for producing energy. Three main types of modern windmills were tested, one horizontal axis and two different vertical axis. We constructed these models out of cardboard and construction paper craft supplies, and used a motor and a multi-meter to measure which turbine model worked best. Results show that the Savonius vertical axis turbine model performed best. There were many variables in this project that may have affected the results such as weight, height, length, etc. We even created original spiral-based turbine designs, which also were very successful.

TEAM – INTERMEDIATE (7TH-8TH GRADE) - SBS

Project Number: MTM007

Grade: 7

Title: Pill Coatings

Abstract: Tested making pills easier to swallow by using different coatings and tested ability to coat, adherence, and slipperiness. Pills (Tic Tac) tested for ease of coating, rolled around to check adherence, and rolled down a tube to see how it slid. Chocolate Fondue, slushy, and Fruit Roll-Up difficult to coat, did not adhere well, stuck to the tube. Slushy ice very difficult to coat, didn't adhere, slid well. Gelatin took long to coat, stuck to the tube, adhered tightly. Butter coated easily, didn't adhere well, slid well. Marzipan coated easily, adhered well, slid well, and thus concluded the best coating.

Project Number: MTM008

Grade: 8

Title: Projectile Motion

Abstract: The purpose of our experiment is to examine the projectile motion of an object. Understanding projectile motion will help us understand how a bullet flies from a gun and how a home run in baseball flies out of the baseball park. To conduct this experiment we built potato shooter to use as the launcher of a projectile. We measured the angle of the projectile and the distance in meters that the projectile flew. Our experiment tried to find what angle would produce the maximum distance. We determined that at 60 degrees our projectile would fly 105 meters.

Project Number: MTM009

Grade: 8

Title: Radical Reactions

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

Project Number: MTM010

Grade: 7

Title: Reaction with 8 Sodas and Mentos

Abstract: The purpose of our experiment was to see which soda produced the highest spray when mixed with Mentos. The experiment was conducted using eight bottles of soda with varying attributes. The same number of Mentos was dropped into each bottle using a cylinder and string specifically designed for dispensing the candy. We noted the height, duration, soda color, soda remaining, and if the spray varied in pattern. We concluded that the Coke Zero sprayed the highest. We noticed that Coke Zero had the most carbonation when we opened the bottle and that this contributed to the height of the spray.

Project Number: MTM012

Grade: 7

Title: What do College Students know about GMOs?

Abstract: We studied how much college students know about genetically-modified organisms (GMO). To find the answers to these questions, we conducted a survey with 107 college students from Clarion University of Pennsylvania who answered five different questions. We predicted the majority of college students would 1) know what a GMO is, 2) not know five GMO agricultural crops, 3) know five foods that contain GMO crops, 4) want labeling of GMO foods, and 5) buy GMO foods if they were labeled. Our results

TEAM – INTERMEDIATE (7TH-8TH GRADE) - SBS

contradicted only one of our hypotheses. We discovered that 1) 64 out of 107 students knew the definition of a GMO, 2) 33 out of 107 could identify two GMO agricultural crops, 3) 72 out of 107 could not identify any foods that contained GMO crops, 4) 81 out of 107 wanted GMO foods labeled, and 5) In conclusion, we discovered that college students do know the definition of a GMO, do not know five GMO crops, do not know five foods with GMO crops, do want GMO foods labeled, and will purchase GMOs if they are labeled.

Project Number: MTM014

Grade: 8

Title: What ever floats your boat!

Abstract: Have you ever wondered why a boat sinks or floats? The reason for our project is to determine the buoyant force of a boat in four different types of liquids. To do this we took our liquids, put them into a bowl, and set a boat to float. Our project is still in progress. Final **Abstract** will be available at exhibit on Fair Day.

Project Number: MTM015

Grade: 7

Title: Which Ice Melt Melts Ice Faster?

Abstract: The purpose of our experiment was to see which types of ice melt works fastest. To conduct the experiment, we purchased three different ice melts – Sodium Chloride, Calcium Chloride and Magnesium Chloride. We froze 12 ¼ cup samples of water. We measured 1T of each ice melt, poured the ice melts over each sample except for the Controls. We measured water from each sample at either 5, 10 or 15 minutes on 3 days. Calcium Chloride worked best 5 times, Magnesium Chloride worked best 3 times, and they tied once. Therefore our hypothesis should be accepted.

Project Number: MTM016

Grade: 7

Title: What Makes the Best Soil?

Abstract: Purpose: to determine which soil combination is better at growing plants. We believe that clay mixed with soil is better at growing plants because there are dandelions and grass growing in my yard, which is mostly clay. Procedures: Purchase 3 plants, mix different soil combinations, try growing plants in different soils, and analyze over time.

Project Number: MTM017

Grade: 8

Title: Shoes vs. High Jumps

Abstract: The purpose of this experiment was to find out which shoes will help you jump the highest, Gel, Shox, or Normal shoes. Gel shoes helped all three subjects jump the highest by eleven centimeters. To measure the height, we took a yardstick and the subject jumped with a sticky note on their and the subject jumped and put the sticky note on the wall. The results showed that all three subjects ranged from eleven centimeters higher to two centimeters higher. The results caused that the gel shoes helped all three subjects jump the highest

TEAM – INTERMEDIATE (7TH-8TH GRADE) - SBS

Project Number: MTM019

Grade: 6

Title: What surface does a ball roll on the fastest?

Abstract: The project is what kind of surface do balls roll on the fastest? The purpose of it is to determine what surface a ball rolls the fastest. First we are going to choose any kind of ball. We are going to compare one ball on 5 different surfaces. Then do the same thing with the other balls. Also we are going to use a stopwatch to see how much time it took. We are going to use a chart to in rows to see how much time and distance. My conclusion may be that the ball that bounces will roll the fastest.

Project Number: MTM020

Grade: 7

Title: Which Duct Tape is Worth the Cost?

Abstract: The purpose of this experiment is to find out what kind of duct tape is more durable, sticky, and is worth the cost. We think that Gorilla Tape will work the best because it is a major name brand. First, we built a display stand with adult help. Then we hung three bottles ketchup, each weighing forty ounces, with duct tape. Next, we timed how long it took for the ketchup bottles to fall. We repeated steps two and three two more times. Then we tested the other two types of duct tape and timed how long it took for them to fall. We repeated the last experiment two more times. Our experiment showed that Gorilla Tape was the strongest, and most consistent, but it was expensive. A cheaper duct tape, Scotch Pro Strength, also performed well. Two issues we had with this experiment was the residue left behind from other tests, which made the ketchup bottles stickier than when we first started. The second issue is different people applied the tape to the ketchup bottles with different amounts of pressure.

Project Number: MTM022

Grade: 7

Title: Why Should We Retire the Incandescent Bulb?

Abstract: As people know, the incandescent bulb is obsolete nowadays. But, the real question that we asked was "by how much". Testing the heat output, LUX, and energy consumed of the incandescent bulb compared to a CFL bulb and an LED light, and then crunching the numbers on how much energy, money, and carbon emission saved if one light, a whole house, and the entire country were switched to one of the alternatives. The work showed that the U.S. would save about \$23,000,000 if everyone switched to either of the two and have a vastly lower energy consumed and carbon reduction.