



**70th PITTSBURGH REGIONAL  
SCIENCE & ENGINEERING FAIR**

**INTERMEDIATE  
DIVISION PROJECT  
ABSTRACTS**

**APRIL 3, 2009**

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

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Project Number:** MBS001

**Grade:** 8

**Title:** Why Aren't We Graduating

**Abstract:** The purpose of this project was to study the effect of the socioeconomic relationship that exist between students on free or reduced lunch programs and graduation/dropout rates.

**Project Number:** MBS002

**Grade:** 7

**Title:** Double-Word Usages

**Abstract:** I am going to test if 20 students can notice double word usages in 20 sentences. I did this because I wanted to see if the eye could notice the double words or just skim by them. Twenty sentences were planned out, some with double words and some without. Data was marked down according to if the student read the sentence right or wrong.

**Project Number:** MBS003

**Grade:** 8

**Title:** Is the Book Better than the Movie?

**Abstract:** Sometimes people say that the book is better than the movie, but other times people say that the movie is better than the book. What differences in reading levels occur between the book and the movie that may influence people's opinion? To complete this experiment, 16 students were tested from grades 7 and 8. These student read a passage in a book and then watched the same passage but in movie form. Students completed a survey in order to determine preferences and comprehension. In conclusion, students preferred the movie over the book and answered more questions correctly for the movie.

**Project Number:** MBS004

**Grade:** 8

**Title:** Name That Tune vs. Silence is Golden

**Abstract:** The purpose of my experiment was to find out if music helps you concentrate, or if it is actually distracting. I chose this topic because I wanted to know, for when I was studying, if having music playing would be beneficial or detrimental. My problem was "Does listening to music help you concentrate or distract you?" My hypothesis was that listening to music would decrease one's ability to concentrate

**Project Number:** MBS005

**Grade:** 7

**Title:** Does Time of Day Affect Driver's Ability to Color

**Abstract:** This project was to determine which most recognized colors of the visible spectrum are the easiest to see in an urban traffic setting at different times of the day. In order to determine this, a procedure was developed to test people to quickly identify and count colored dots randomly arranged over the top of a picture of a busy urban traffic setting. Once all dots were counted, time was recorded. The test was done on three different pictures of an urban traffic setting (6:00 a.m., 12:00 p.m. and 6:00 p.m.), which were covered with five individual transparencies, each containing one color in the visible light spectrum. A total of 30 test subjects were used to compile a data table of over 450 test points, which resulted in charts showing average response times to recognize colors. The conclusion did not support my hypothesis, though the focus test group may have had an effect on the results.

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Project Number:** MBS006

**Grade:** 7

**Title:** Mirrors & Behavior of Cal Sea Lions in Captivity

**Abstract:** This project intends to discover how a mirror influences the behavior of the two female and one male California Sea Lions at the Pittsburgh Zoo and PPG Aquarium. Mirrors offer solutions to problems associated with Sea Lions—including encouraging breeding. California Sea Lions on the Washington State Coast eat 3.5% of endangered Chinook salmon. Methods used to scare them off including lethal removal. If mirrors distract sea lions and they react like the Pittsburgh Zoo male did, then game wardens could strategically place mirrors to keep the sea lions away from the river and the salmon.

**Project Number:** MBS008

**Grade:** 8

**Title:** Cell Phones vs. Reaction Time

**Abstract:** The title of my investigation is "Cell Phones vs. Reaction Time." I have observed that people everywhere talk on their cell phones while driving. The purpose of this investigation is to determine if talking on a cell phone affects reaction time. Have subjects talk on a cell phone and see if he or she can catch a ruler. My hypothesis was supported by the data. The subjects that didn't talk on tge cell phone had a better average.

**Project Number:** MBS009

**Grade:** 7

**Title:** Pseudoscience? Is it for real?

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

**Project Number:** MBS010

**Grade:** 8

**Title:** Does Texting Distract People?

**Abstract:** The purpose of this experiment is to see if texting distracts people. First the subject played the first level of Pacman for two minutes. When they were done their score was written down. Then they were given a cell phone and told they would receive texts and they were to respond. The subject played the same level for two minutes and their score was taken. The data showed that twenty-two people did worse with texting and that only seven people did better with texting. In conclusion the experimental hypothesis was supported. More people were distracted while texting and playing Pacman.

**Project Number:** MBS011

**Grade:** 8

**Title:** Caffeine and reaction time.

**Abstract:** My investigation consists of testing volunteer's reaction times. For my procedures I tested each volunteer with out caffeine using a Pico Cricket Reaction Timer.. Then I had them drink 250 ml of Pepsi. After they waited 15 minuets they were tested again, with a Pico Cricket Reaction Timer. After I averaged results and concluded my experiment. 51% of my volunteers had a faster reaction time with caffeine. In conclusion caffeine does affect a person's reaction time.

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Project Number:** MBS012

**Grade:** 8

**Title:** Singing On Pitch

**Abstract:** The purpose of this experiment is to find if a relative pitch is more commonly found in different genders, ages, and those with musical training/background. In this particular experiment, subjects were required to sing a three note sequence. The data (pitch) was collected. Quantitative data included the pitch of each of the three notes and the qualitative data included whether or not the subject believed they had sung on pitch or not. Data collected showed no significant difference in any gender, age, or musical background but an interesting result for subjects' beliefs.

**Project Number:** MBS013

**Grade:** 8

**Title:** Heart Races: How Do Vital Signs Vary with Movie Genre?

**Abstract:** Television shows and movies are meant to make people feel something on an emotional level. A question to be examined is how do individual vital signs vary with a particular genre? The Movie genres were chosen according to potential impact on vital signs. Romance, Comedy, Action, and Suspense are some of the main categories of movie genres to be evaluated. Pulse, respiration and blood pressure will be measured in 8th grade students after movie clips are viewed.

**Project Number:** MBS014

**Grade:** 8

**Title:** How Do Fears Vary?

**Abstract:** Children in an elementary school (K-8) exhibit a wide variety of children that interact and learn in a similar environment. Fear is something that all children experience at one point or another. The question is whether or not children had similar fears no matter their age. Students in grades 1-8 were surveyed on twenty- five common fears, and these fears were evaluated and sorted based on grade level and gender. Comparisons among the grade levels and between genders were made.

**Project Number:** MBS015

**Grade:** 7

**Title:** Boys vs. Girls: Short-Term Memory

**Abstract:** The purpose of this experiment was to determine whether boys or girls have better memory. I used ten words and ten items in my test, and I gave my subjects thirty seconds to look at the items/words and gave them one minute to wait before they could tell me how many they could remember. I tested five boys and five girls. The conclusion was that the boys' and girls' memories were pretty evenly matched.

**Project Number:** MBS016

**Grade:** 8

**Title:** Does Age Affect the Stroop Test?

**Abstract:** Find difference in cognitive abilities between children and adults.

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

Procedure: 1. Gather subjects 2. Create tests Control test - 20 words in real color. Experiment test - 20 words in different color. 3. Subjects test by writing the color of the ink used. Test timed. 4. Score tests. Number right divided by total 5. Average group results (%) Data: Ages 9-39 completed test with more accuracy & efficiency than ages 4-59. Conclusion: Data supports the original hypothesis. Age effects the Stroop Test. Test subjects ages 10-19 completed test with more accuracy & efficiency than ages 40-59.

**Project Number:** MBS017

**Grade:** 7

**Title:** How Temperature Affects The Performance Of The Brain

**Abstract:** I decided to test the memorization of the brain in three different temperatures. I wanted to know if the temperature of the classroom affects the students' ability to learn. I selected five random one-digit numbers and put them into a sequence and five letter sequences for a total of ten test questions. A different test was made for each room temperature. Participants were given all three tests. Test results varied from person to person. Additional research is required including adding time constraints and increasing the number of test subjects.

**Project Number:** MBS018

**Grade:** 7

**Title:** Does Exercise Affect Memory?

**Abstract:** The purpose of my project was to evaluate the influence exercise has on memory skills. Fifteen members of the St. Elizabeth cross-country team were the subjects. The same memory test was taken twice: then immediately following exercise and the other two weeks later without the influence of prior exercise. The results did not support my hypothesis, however, there are influencing variables which may have affected the ability to concentrate and therefore change the results. These variables are; the order in which the test was taken, the cold weather, and that the test was given in a group rather than individually.

**Project Number:** MBS019

**Grade:** 8

**Title:** Musical Memory

**Abstract:** The purpose of the experiment was to test how music may improve student memory performance. Students were exposed to music and the a control of no music during short term memory performance tests. The experiment found mixed results with most students performing best with no music.

**Project Number:** MBS020

**Grade:** 7

**Title:** Show or Tell?

**Abstract:** The purpose of my experiment is to determine whether people remember things better by seeing or hearing. This experiment tests short-term memory. I generated random 10-letter sequences. The person looked at it 30 seconds. They recited the alphabet to block their working memory. I recorded and scored what they remembered and repeated to me. Next, I repeated a different sequence three times slowly. They recited the alphabet. I recorded and scored what they remembered and recited back to me. I repeated the process on 20 subjects and charted the results. I concluded people tend to remember more by seeing.

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Project Number:** MBS021

**Grade:** 8

**Title:** Mind and Touch

**Abstract:** The reason I'm doing this project is because I want to see when people feel a certain way is because the way they want feel about it or the way the mind think. Everybody feels a different way. Everyone has different temperatures. This is a whole new thing for me to do. I might feel one way but later I can feel a whole new way. It's like when you really think about it the worst you get. If you start out being cold you will only get colder. I want to prove that not everything you feel is the way you really feel. I will tell people to think one way then think the opposite.

**Project Number:** MBS022

**Grade:** 8

**Title:** Gettin' Down with the Dogs

**Abstract:** The purpose of this experiment was to determine which dog toy is favored most. All dogs have different personalities, so the question was, "which toy would the dogs go after the fastest?" To determine this, 16 different dog toys were selected and put into 3 different groups. These groups included interactive, flavored and colored dog toys. The toys were placed on the floor and the dogs were let go at a given signal. The timing started as soon as they were let go. Times varied within the groups, but the dogs went to the flavored toys the fastest.

**Project Number:** MBS023

**Grade:** 7

**Title:** Low fat vs Reglular Chips

**Abstract:** Purpose: To find out if people know the difference between low fat and reglular chips  
Procedure: 1 get supples 2 get family together 3 write observations 4 type down on computer 5 Print and put on board

**Project Number:** MBS024

**Grade:** 8

**Title:** My Music Score

**Abstract:** Purpose: To find out which type of music gives a middle school student the best testing enviornment. Hypothesis: Classical music will most benefit the studnets test scores.  
Procedure: 1. Give each student test one and instruct the studnets to start. 2. Play the music until all students are done with their test. 3. Collect and correct the tests. 4. Repeat all steps until each music genre has been tested. Conclusion: Classical music most benefited the students. Rock music least benefited the students.

**Project Number:** MBS025

**Grade:** 7

**Title:** SeaLion's Eye-Catching Objects

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

**Project Number:** MBS026

**Grade:** 8

**Title:** Fear Factor!

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** I had two groups of test subjects. One group was told what is going to happen in a scary movie and the other was not. I took their heart rates before and after each person watched the movie and compared my results to see if knowing what happens before it occurs effect how scared someone is.

**Project Number:** MBS027

**Grade:** 8

**Title:** Visual Variance

**Abstract:** The purpose of this experiment was to the assumption that males are generally better than females at visual cues. Three visual searches with one, two, and three distracters were prepared. Both genders were presented all of the searches and timed on how fast the target was found in each visual search. The data in this experiment showed that both genders had varying times, and both groups were adversely affected when more distracters were added to the visual searches.

**Project Number:** MBS028

**Grade:** 8

**Title:** Multitasking & Learning

**Abstract:** The Purpose of the project was to find out how multitasking impacts how humans learn. Subjects were tested by reading 2 stories in 2 groups. Subjects 1-9 read one story first, while subjects 10-18 read the other story first. They read story 1 with distractions, and story 2 with no distractions. After reading these stories, the subjects took comprehension tests on them. They were timed on how long it took them to finish reading and testing on the stories. The results concluded that subjects did better with no distractions.

**Project Number:** MBS029

**Grade:** 7

**Title:** Running with your I-Pod

**Abstract:** I chose this experiment because I am a cross-country runner and the results can be helpful for training in the future. It can also help my other team-mates. Conducting this procedure was easy. There were only two runners running at a time. Which was easy to keep track of times.

Rock n' Roll was the type of music that helped the runners the most. Classical was a close second. And running with no music did the worst. In conclusion, my hypothesis was correct. All runners agreed the classical was least enjoyable for them to run to. Rock n' Roll won.

**Project Number:** MBS030

**Grade:** 7

**Title:** How Do Video Games Affect You?

**Abstract:** Purpose: To find if video games affect you. Hypothesis: The game would affect you more. Conclusions: The game affected you more. Procedure: Gather materials, make a test, set timer for 35 min, say go, observe the person, then stop. Repeat the process over again but with nonviolence.

**Project Number:** MBS031

**Grade:** 8

**Title:** How well do kids gauge length?

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** My experiment test how well kids estimate lengths using vision. I'm also comparing if they are more accurate using the English or Metric system of measurement. I did this because I thought it would be interesting to see the difference in accuracy between the two. I conducted this by asking kids how long a certain object is, first using inches and then using centimeters. I have not done this experiment yet and therefore do not know the outcome.

**Project Number:** MBS032

**Grade:** 8

**Title:** The Stroop Effect

**Abstract:** The purpose of this experiment was to see if Stroop Effect interference between colors occurs with children who can't read. Knowing the effect of interference is important because it can improve methods of teaching reading to children. This experiment involved constructing two different ink tests and using those tests on a group of children who can read and a group of children who can not read. After testing the two groups of children, the reaction times and responses were recorded and the results compared. The amount of Stroop Effect interference differed between children who can and who can not read.

**Project Number:** MBS033

**Grade:** 7

**Title:** Reading

**Abstract:** The purpose of the experiment was to determine if seventh grade males read color words faster and with fewer errors than seventh grade females. Participants were timed while reading a list of fourteen "color" words using the Stroop Test. Data included speed average and error average for males verses females. Conclusions indicated that the seventh grade females did read "color" words faster and with fewer errors, but only by a minimal margin.

**Project Number:** MBS034

**Grade:** 8

**Title:** Physical activity and testing.

**Abstract:** The objective of the investigation if to see if physical activity has an effect on math test scores. I gave volunteers a basic math test before and after exercise. I found that students preformed an average of 2% better after exercise. Although this is a small percentage exercise did indeed affect test scores in a positive way.

**Project Number:** MBS035

**Grade:** 8

**Title:** Predictors for Elderly Depression

**Abstract:** Depression in an adult's later life can be caused by many different factors. The experimenter hypothesized that certain social, health, and economic circumstances are associated with depression in later life. With permission, 27 elderly people were given a questionnaire containing a standardized depression rating scale and a list of fifteen questions related to specific social, health, and economic stressors. The collected data was then subjected to statistical analysis to determine the significance of each stressor. The researcher found that certain specific social, health, and economic circumstances were associated with depression in later life.

**Project Number:** MBS036

**Grade:** 7

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Title:** Does the color of a drink affect the way a person expects it to taste?

**Abstract:** I tested to see if the color of a drink affects the way a person expects it to taste. I wanted to see if a person's sight affects the way they taste things. I think my results will show that some colors affect the way a person tastes the drink but other colors will not. I believe that my conclusion will show that the color of a drink does affect the way a person expects it to taste.

**Project Number:** MBS037

**Grade:** 8

**Title:** Cell Phones and Reaction Time

**Abstract:** The title of my project is "Cell Phones and Reaction Time". I decided to do this investigation when I heard drivers talking on cell phones are more likely to cause a car accident. I had my subjects talk on a cell phone while a held up a meterstick. I dropped the meterstick and measured how fast they caught it. They did the same thing with no cell phone. Subjects had a slower reaction time when they were talking on a cell phone.

**Project Number:** MBS038

**Grade:** 7

**Title:** Colors Messing With Your Brain

**Abstract:** Colors Messing with Your Brain is an interesting project in which people's perceptions are tested. This project was intended to see what gender can react faster, male or female. There were 18 index cards, which had 6 different colors written on them. Each color was written in a different color every time, but never in its own color. As 10 males and 10 females were tested their times were recorded. It was proven that females reacted faster, even if it only by .7 seconds. A similar project dealing with shapes may also be performed.

**Project Number:** MBS039

**Grade:** 8

**Title:** How Does Stress Affect Your Memory

**Abstract:** The purpose of my project is to learn more about the human brain and how it works, particularly the affects of stress on memory. I will do this by grouping twenty people and giving a test on previously memorized facts. One group will be stressed, while the other will not. I will grade the tests by amount answered correctly. My hypothesis is that the people in the stressed group will not do as well as the people in the stressed group because they will have more facts to learn and that the men will not do as well as the women because they did not try as hard.

**Project Number:** MBS040

**Grade:** 7

**Title:** Which Gender Can Complete the Brain Teasers Faster?

**Abstract:** The purpose of my project is to find out who can complete the brain teasers faster between males and females? I ran three simple expirements on an equal amount of males and females, then recorded their times. After conducting all three my experiments I have concluded that the females have the faster working brains than the males. The males altogether completed one of three brain teasers faster than the females by 00:70.98. The females altogether completed two of the three brain teasers faster than the males by 03:60.07 and 01:95.81.

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Project Number:** MBS041

**Grade:** 8

**Title:** Slamina Lufroloc

**Abstract:** The color of bees and road signs is often chosen to attract our attention. The colors say "Caution/Warning". This experiment is to find out if the color of a picture will cause the test subject to recall it more easily than another color. 10 pictures of animals were used each colored in with crayons of a different color/color combination. 9 students observed them for one minute and then recited them in the order they remembered them. It was found that no clear color was remembered easier although some colors stood out more to the subjects. More study is planned.

**Project Number:** MBS042

**Grade:** 8

**Title:** The Keyboard Test

**Abstract:** The purpose of my experiment was to find out which was faster when typing, the number line across the top of the keyboard or the number block to the right side of the keyboard. I had the subject type problems from a sheet of paper using the number line. I would time them. I would then have the subject take the test again using the number block. The data shows that the two number areas were close in times but the conclusion was that when the times were averaged, the number block was faster overall when typing.

**Project Number:** MBS043

**Grade:** 7

**Title:** Television Commercials and Memory

**Abstract:** The purpose of this investigation is to determine which Coca-Cola commercial people remember the most. 10 fifth grade students were shown 3 Coca-Cola commercials. After each commercial the students were given a test on the commercial right after it was shown, 2 hours after it was shown, and the day after. People remembered the first commercial the most because it showed very positive emotions. The second commercial placed second, and the third commercial placed last. I have concluded that commercials with positive emotions are remembered more than commercials without positive emotions.

**Project Number:** MBS044

**Grade:** 8

**Title:** Perfect Pitch

**Abstract:** The reason I chose to do this experiment is because I wanted to find out if I was a good singer because I was male, fourteen, or because I have a background in music. I had test subject remember the notes that I played on the piano from one to eight. Then I said one of those numbers. I then asked them to hum or sing the random note. After they did so, I recorded by observations. The subject with the musical background won the test with a higher score.

**Project Number:** MBS045

**Grade:** 8

**Title:** Males VS. Females

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** Everyone wants to know the question: Do males or females have a faster reaction time? I hoped to achieve that answer in my experiment. For my experiment, I chose three different tests. Two of the tests involved me making two different types of flash cards and my volunteers reading off the answers to me. The other test involved me dropping a ruler into the volunteers hands. My results were that males and females had basically the same test results. Other than that, I learned that age does affect test results.

**Project Number:** MBS046

**Grade:** 8

**Title:** See No Numbers, Hear No Numbers

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

**Project Number:** MBS047

**Grade:** 8

**Title:** Reliability of Eyewitness Accounts

**Abstract:** The experiment was conducted to see if eyewitness accounts are accurate enough to convict a criminal. An actor went into a classroom saying he is from the IT Department and will go to the teacher's computer for three minutes before departing. The Computer Technology teacher will enter the room after ten minutes saying that the IT Department had not sent anyone to the school and will instruct the students fill out a questionnaire describing the actor; repeat the experiment five additional times. It was concluded that eyewitness accounts are accurate because the data collected shows that the questionnaires had an average of seventy-percent accuracy.

**Project Number:** MBS048

**Grade:** 7

**Title:** Does Your Behavior Change After Lunch

**Abstract:** Purpose:

The reason I am doing this project is because I would like to see how much my class behavior change  
Procedure: 1st.I examine my class behavior 2nd.I mark down the most common things my class does 3rd.I get my conclusions together 4th.I glue my things onto my board  
Hypothesis: I think that my class behavior wont really change.

**Project Number:** MBS049

**Grade:** 8

**Title:** How Do Fears Change with Age?

**Abstract:** The purpose of the experiment is to find out if fears change as a person ages. First participants were split into three age groups. To complete this experiment, a pre-survey was given and the answers were recorded. Then, these first survey answers were used to create a second survey, and results from the second survey were recorded. The oldest age group has life related fears and younger participants had childish fears. Fears fro some participants did change over time.

**Project Number:** MBS050

**Grade:** 8

**Title:** What color affects memory the most?

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** For my 8th grade science project and for my SciTech project I decided to test the affect of color on retaining information. I will test a 6th grade reading class to see if reading an article and taking a test on that article in yellow had higher or lower scores than that of people who took this test in white. This work will test if studying in yellow or white helps retain information. I am currently waiting for the results of this experiment.

**Project Number:** MBS051

**Grade:** 8

**Title:** The Effect of Gum Chewing on Mental Abilities

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

**Project Number:** MBS052

**Grade:** 8

**Title:** Color to Memory

**Abstract:** Purpose: My purpose is to see whether changing the color of common objects affect our memory of them when shown two sets of pictures Hypothesis : I think that the people that I used in my experment will remember the pictures with their oringal colors better.  
Procedure: 1.Show the cards with the oringal color first 2. Then aks them to say what they saw back to you 3. Record our observations 4. Repeat steps 1 through 3 with the irrelugar colors Conclusion: In the End I proved my hypothesis wrong

**Project Number:** MBS053

**Grade:** 8

**Title:** Competition and Performance

**Abstract:** The Purpose of this experiment is to see how people perform when alone V.S. how the perform when competing with others. I will test students to see how long it takes them to put together a block puzzle when they are alone in a room and then solve a different puzzle when they are competing with a group. I have not yet completed this experiment so I can not analyze data or come to a conclusion at this point.

**Project Number:** MBS054

**Grade:** 8

**Title:** Food Affecting Sleep

**Abstract:** This experiment planned to determine whether food affects sleeping habits. Four subjects were told to eat different foods every night and complete a survey every night over 30 days. Data collected included time subject went to sleep/woke up, how many times subject woke up, and how many times subject went to the bathroom. The data also included the kind of food the subject ate, sleeping qualities (hard to fall asleep, still tired) and their dreams. After testing subjects for a month the results showed that food doesn't affect sleep of the subjects in this test but drinks do.

**Project Number:** MBS055

**Grade:** 8

**Title:** Who Can Twist It Up Better

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** My Purpose is to see which gender in my class can say tongue twisters better. I think that the s will say the tongue twisters better because they catch onto things better. I tested the s then the boys with the same five tongue twisters.

**Project Number:** MBS056

**Grade:** 7

**Title:** Reaction Time and Cell Phones

**Abstract:** This experiment compares the difference between a person's reaction time while talking on a cellular phone and a person's reaction time without using a cellular phone. The procedure tested subjects' reaction times by dropping a meter stick and measuring the distance that the meter stick fell before it was caught. This test was done while the subject was focused and again while distracted by a cellular phone conversation. The results supported the hypothesis. When subjects were distracted, it took a longer amount of time to catch the meter stick. Subjects' reaction times were slower when distracted by the phone.

**Project Number:** MBS057

**Grade:** 8

**Title:** Violent Kids

**Abstract:** Purpose: To see how much kids know about. Hypothesis: I think 70% of the classes will know a lot about. Procedure: Print out permission slips, print out survey, talk to kids about, Graph results for survey, & watch the news for 3days. Conclusion: My outcome was that both classes knew a lot about. The proved my hypothesis wrong because a lot of them a lot more then I expected.

**Project Number:** MBS058

**Grade:** 8

**Title:** What Behavioral Skills Do Kids Show?

**Abstract:** Purpose:To see how many kids will misbehave on activity days. Hypothesis:More kids will misbehave on activity days. Procedure:Make permission slips for teachers, get all information from the teachers,gather it up and compare.Conclusion:More kids behaved than more kids misbehaved.

**Project Number:** MBS059

**Grade:** 8

**Title:** Dodging Reflexes

**Abstract:** Dodge ball is played in many gym classes and some kids are better than others at the game. The purpose of this experiment was to determine if there is a connection between improved reflexes and better dodge ball skills. Twenty-four volunteers were tested to see how fast their reflexes were. This was done by catching a falling ruler. After grouping the volunteers in three different teams, according to ruler test results, all volunteers participated in five doge ball games. According to the data collected, a difference was found between the three groups.

**Project Number:** MBS060

**Grade:** 7

**Title:** Can You Pass?

## INTERMEDIATE DIVISION – BEHAVIORAL AND SOCIAL SCIENCE

**Abstract:** If adults fail a science test, maybe they should take a courses in basic science. First find people for your study and make your tests and rule sheet. Once you copied, mailed, received, and graded them, average scores. It resulted in an 80% average. Males scored higher than females. My results can't be a predictor due to small sample size. I learned older people score lower. It's beneficial to society because people should take courses in basic science if scored low. My hypothesis was supported because older people scored lower. If I repeat this, I should have a controlled environment.

**Project Number:** MBS061

**Grade:** 8

**Title:** Candy Confusion

**Abstract:** The title of my investigation is Candy Confusion. I have observed people of all ages mistaking medicine for candy. The purpose of this investigation is to determine which age group can best tell the difference between candy and medicine. I handed subjects the pictures of candy and medicine. I then instructed the subjects to place pictures of candy in one pile and medicine in another. My hypothesis was supported by the data that adults identify the most correct.

**Project Number:** MBS062

**Grade:** 7

**Title:** Hands-Free Calling: The Cell-ution?

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

## INTERMEDIATE DIVISION – BIOLOGY

**Project Number:** MBI001

**Grade:** 8

**Title:** How does the amount of light effect plants

**Abstract:** In my project I will be seeing if the plant will grow better in the sunlight, under a plant light, or in the darkness. In the darkness there are only a couple yellow leaves but it's still growing higher. Under a plant light it grew a whole inch. But my hypothesis is that my plant will grow better in the sunlight because the sunlight gives it photosynthesis which makes it greener. In photosynthesis it's like we give carbon dioxide to the plant and the plant and the plant gives oxygen to us. But under a plant light it gives carbon dioxide and other minerals.

**Project Number:** MBI002

**Grade:** 7

**Title:** X Marks The Spot

**Abstract:** I'm doing my project because I have a tortoiseshell cat. I wanted to see if her face was patterned. I took pictures of ten cats. Then, I divided each face into twelve regions. I wrote down the color of each region and looked for a pattern. I didn't find a pattern. I believe that the region with a 90% majority of one color was a coincidence because I took a random sampling of cats. My hypothesis was supported. If I did my project again, I would use more cats and see if a male cat would make a difference.

**Project Number:** MBI003

**Grade:** 8

**Title:** Magnetic Fields on Radishes

**Abstract:** This study examines the effects of weak magnetic fields on the growth of radish plants. Solenoid cells were constructed, and radish seeds were planted in three large containers. Two containers were placed within the solenoid coils, while the control group was not. Two strengths of magnetic fields were tested for three weeks along with the control group. The results show plant height, leaf length and leaf width to be greater for plants grown in weak magnetic fields. Root diameter and the number of mature leaves per plant were also affected. Weak magnetic fields had a positive impact on the growth of radish plants.

**Project Number:** MBI004

**Grade:** 7

**Title:** Effect of Common Pollutants on Fresh Water Algae

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

**Project Number:** MBI005

**Grade:** 8

**Title:** Breath of Life

**Abstract:** The purpose of this experiment was to determine the difference in lung capacity between athletes and musicians. To complete this, 60 students first completed a survey in order to put them into one of 3 testing groups (athletes, musicians, control). Then, using the water displacement method, the total lung capacity of the students was determined. Record the water displaced in milliliters. When comparing the groups' final lung capacities, the more active participants were found to have the greater lung capacity, specifically the most active athletes.

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**Project Number:** MBI006

**Grade:** 7

**Title:** Evaluation of Methods to Reduce Household Germs

**Abstract:** Research indicates that germs, including common bacteria and viruses, can cause odors.

What is the best method to reduce or eliminate the odor-causing germs on kitchen sponges? Several different methods to eliminate germs were tested on synthetic household sponges. Methods included heating in a microwave, washing in a dishwasher, and rinsing with a bleach solution. After being "cleaned," sponges were then swabbed onto nutrient agar plates and the resulting bacterial growth was documented.

**Project Number:** MBI007

**Grade:** 8

**Title:** Transpiration

**Abstract:** In the project I found which type of plant transpires the most water. To start the experiment cover jars with saran wrap, and put different types of plants into the jars. Then record the weight of the jars/plants, and sit them in a sunny window for five days. After the five days retake the weight of the jars; subtract the weights of the jars to get your results. The data showed that the fern transpired the most water (2.65g) then the spider plant (1.1g) then the broad leaf house plant (0.8g). These results did not support my hypothesis.

**Project Number:** MBI008

**Grade:** 7

**Title:** What affects the growth height of a bean plant?

**Abstract:** The purpose of this experiment was to determine if using caffeinated Diet Coke instead of water would affect the growth height of a bean plant over a 30 day period. I gave 8 Great Northern Bean seeds 15mL of caffeinated Diet Coke every other day. I also gave 8 Great Northern Bean seeds 15mL of tap water every other day. I measured the height of each plant every 3 days and averaged the groups to see which group grew taller. It was found that the plants subjected to Diet Coke grew 1.9125cm taller than the plants that received tap water.

**Project Number:** MBI009

**Grade:** 8

**Title:** Bugs Away The Natural Way

**Abstract:** My project's purpose is to find useful, natural insect repellents in common plant materials as an alternative to synthetic pesticides. Osage orange and catnip materials were tested in four separate trials. They were placed on one side of a terrarium divided into two chambers with twenty crickets. The osage orange seemed repellent. The catnip appeared to attract the crickets. I believe that my data shows that osage orange material is repellent to crickets whereas catnip attracts them. If I redesigned my project, I would test more types of insects in a different setup using the essential oils of both materials.

**Project Number:** MBI010

**Grade:** 7

**Title:** Worms

**Abstract:** The purpose of my experiment was to figure out which part of a worm grows the fastest. My hypothesis was that the tail of the worm would grow the fastest. First, I took nine

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worms and cut them each into third's. Then, I placed each body part into a different container. Finally, I measured the worm parts for about one week. In the end, my hypothesis was not supported because the tail grew the slowest, the body grew the fastest, and the head grew the second fastest.

**Project Number:** MBI011

**Grade:** 8

**Title:** How does music affect fish?

**Abstract:** I am doing this experiment to see if the reaction time, speed, and the consumption of food in feeder goldfish changes with or without music. For my procedures I first will set up the tank. After I will put the fish in and begin testing them. Following each test I will record the data and repeat every day for two weeks. Since I have not tested yet I did not receive my data or conclusion.

**Project Number:** MBI012

**Grade:** 7

**Title:** Desk Bacteria

**Abstract:** The purpose of my experiment was to determine how much bacteria accumulates on a student's desk over the course of a day. Based on my research my hypothesis was that bacteria growth would be larger in the afternoon as compared to the morning. To test my hypothesis, I swabbed student desks in the morning and inoculated TSA plates and incubated them for 48 hours. I then swabbed student desks in the afternoon and inoculated TSA plates and incubated them for 48 hours. I then counted the number of colonies on the plates. My conclusion is that students wiped away the bacteria with their actions causing there to be less bacteria at the end of the day.

**Project Number:** MBI013

**Grade:** 7

**Title:** The Balancing Act

**Abstract:** My question is how will different proportions of plants and animals effect the overall health of a closed system? I hypothesized that plants and snails would have the best ecosystem. For my procedure I filled three .95L jars with purified water and aquarium gravel. Then I seperated the jars by putting two snails in the first jar, two plaonts in the second jar, and two snails and plants in the third jar. I observed the daily activity of the snails, and recorded weekly the color of the plants, clarity of the water, temperature, and pH levels for each trial. In conclusion, my hypothesis was proven correct. The jar with snails and plants had the best overall ecosystem conditions.

**Project Number:** MBI014

**Grade:** 7

**Title:** Does Smell Affect Your Sense of Taste?

**Abstract:** The purpose of my experiment was to determine if smell affects someone's sense of taste. My hypothesis was that smell does affect someone's sense of taste. To test my hypothesis I blindfolded 10 people and had them taste food and then identify the food that they were tasting while still blindfolded. I then blindfolded 10 more people, plugged their nose, and then had them taste food and then identify that food while they were still blindfolded. The result of my experiment was that those people without their nose plugged identified more food correctly than those with their nose plugged.

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**Project Number:** MBI015

**Grade:** 8

**Title:** Acid Rain: PH Affecting Plants

**Abstract:** My experiment involved figuring out how much of an effect the PH level of water affected the growth rate of the plant with which it was watered. This experiment would also simulate watering plants with acid rain (which is rain that occurs when air pollution affects the PH of rain while it is still forming). This experiment appealed to me because I am interested in how humans affect the environment. My problem was, "How does the PH level of water affect the growth rate of the plant that it waters? Which PH level is the best with which to water plants, and which is the worst?" For my hypothesis, I predicted that the best PH level with which to water plants was six, and that the worst was 3. I also predicted that as the Ph neared the neutral levels of the PH scale, the growth rate would increase.

**Project Number:** MBI016

**Grade:** 7

**Title:** The Natural, The Better

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

**Project Number:** MBI017

**Grade:** 7

**Title:** Brain Freeze Experiment

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

**Project Number:** MBI018

**Grade:** 8

**Title:** Cord Blood/Stem Cells

**Abstract:** Nowadays, people are saving cord blood in banks. Cord blood consists of embryonic stem cells and is found in the placenta. This work is to observe how it is beneficial and crucial for the development of biomedical sciences. Research was conducted using different resources. It was determined that cord blood is beneficial by having the youngest stem cells which allow the body to change them into the tissue it needs and by being genetically matched to the patient and his family- concluding that they are easier to match, and immediate response from the affected area in the body.

**Project Number:** MBI019

**Grade:** 7

**Title:** How High Cats Can Jump

**Abstract:** Cats jump to get on everything, couches, chairs, desks, and shelves. This study was to see how high the average cat can jump. I built seven platforms 0.304 meters away from each other. To get the cats to jump, I used a laser pointer. I measured the platform they jumped to and recorded it. I found out that the younger cats jump higher. The highest the cat jumped was 1.615 meters. This was a two year old male cat.

**Project Number:** MBI020

**Grade:** 8

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**Title:** As the Beat Goes ON...

**Abstract:** Music is enjoyed by many people around the world. This experiment was intended to learn if the tempo of music affects one's heartbeat. I listened to two different songs. One of the songs had a fast tempo and the other song had a slow tempo. I recorded my pulse every ten seconds for two minutes during each song. Three trials were performed for each song. Both of the songs increased the heart rate, but the fast tempo song made the pulse increase more.

**Project Number:** MBI021

**Grade:** 8

**Title:** To Grow or Not to Grow

**Abstract:** Can Basil plant growth be affected by an additive in the water? The experiment I did showed if you can improve the overall growth of basil plants by supplementing the water. For 35 days I gave 5 basil plants different solutions which were mixed in one cup of water, 500mg Vitamin C, 500mg Vitamin B12, 2 T.B. 7-Up, and 2 T.B. Sugar. Everyday 10mL of each solution was given to its corresponding plant. I took pictures each day and kept a growth journal. I found that plain water helps basil grow best. Sometimes doing nothing is the answer in experiments.

**Project Number:** MBI022

**Grade:** 7

**Title:** Heartrate with Pets

**Abstract:** This project is about how a hamster is able to lower a person's heart rate. My procedure was to take ten people and take their heart rate before the experiment with interacting with a hamster. Then you would compare their heart rate to average preteen female heart rate. After I completed my science experiment I concluded that interacting with a hamster will calm down someone's heart rate. Overall after I completed my entire science project I found out that my hypothesis was correct.

**Project Number:** MBI023

**Grade:** 8

**Title:** Worm Regeneration

**Abstract:** The purpose of the experiment was to see if worm will regenerate lost tissue faster under strong magnetic forces. Worms were dissected partly and then one group was exposed to a strong magnet, while another test group was exposed to no magnet. In conclusion, worms exposed to the magnet did regenerate lost tissue faster and grow faster.

**Project Number:** MBI024

**Grade:** 7

**Title:** A Frizzy Situation

**Abstract:** The title of my project is "A Frizzy Situation". The question I asked was when doing this experiment was "Will it make a difference if the hair in a hair hygrometer is dyed?" My hypothesis was that the dyed hair would be less accurate because the dye alters your hair so much that it might change the way hair frizzes. First I made the hygrometers with strands of colored and natural hair. I checked the readings every day for four weeks and saw how accurate the readings were by using a pycrometer. After four weeks I have concluded it does not make a difference in the accuracy of a hygrometer if the hair is dyed.

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**Project Number:** MBI025

**Grade:** 7

**Title:** Good for You, Good for the Plant

**Abstract:** 277 grams of soil will be placed in planting pots. Three beans will be planted in each container and transplanted until each container held three plants. Six trays hold 10 pots. The trays will be placed 38 cm from the grow lights. The five vitamins being used are Niacin, Potassium Gluconate, B 1, B 6, and B 12. 250 mg of vitamins will be crushed before dissolving them in tap water. The plants will be watered twice a week. The plants will be measured and the height and biomass will be measured to determine the effect on plants.

**Project Number:** MBI026

**Grade:** 7

**Title:** Will different types of water affect the growth height of a bean plant?

**Abstract:** I have completed a science project for my seventh grade science class and for Sci-Tech. The purpose of this experiment was to see which type of water, DuBois tap water, or Deer Park bottled water would affect the growth height of a bean plant. The dependent variable in my experiment was the growth of a bean plant measured by height. The independent variables were the types of water that I used, which included: DuBois tap water and Deer Park Bottled Water. My controlled variables that I needed to keep the same throughout the experiment include: type of seed, type of container, potting soil, amount of soil per container, depth the seed is planted, amount of water per container, amount of sunlight, the temperature, each of the twenty plants to be watered every day, and the same environment.

**Project Number:** MBI027

**Grade:** 8

**Title:** Does radiation affect seeds?

**Abstract:** The purpose of this project is to determine whether the radiation of seeds affects their growth. To complete this experiment, the experimenter will put three sets of Lima Bean seeds into microwave. One set of seed will be put into the microwave for one minute, one set for two minutes, leaving one set without any radiation. Next, the experimenter will put each set of seeds in separate pots with soil in them and record the growth in each pot. I have not yet completed this investigation therefore I can not come to a conclusion at this point.

**Project Number:** MBI028

**Grade:** 8

**Title:** The Effects of Stomach Acid on Oral Allergy Medication

**Abstract:** Many people suffer from allergies and have a variety of symptoms. Over the years, a variety of over-the-counter (or non prescription) medications have been used to treat these conditions. However, many television commercials indicate that some allergy medications can provide relief from allergy symptoms faster than other over the counter (or OTC) allergy medications. So the question arises, which medication will dissolve the fastest? Five common allergy medications were tested in two different solutions; a hydrochloric acid (pH ~ 1) and a less acidic hydrochloric acid solution (pH ~3). Medication dissolving times were recorded.

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**Project Number:** MBI029

**Grade:** 7

**Title:** Forensic Feet

**Abstract:** The purpose of my study was to see if a group of people could tell the difference between a man and a woman by looking at the feet. I sent out permission slips to see if I could get any people to get their feet taken a picture of. I started taking pictures. I printed out the pictures and hung them up on a wall. I then asked people to come and look at the pictures and see if they can tell the difference. My results are inclusive and they will be finished by the time of the science fair.

**Project Number:** MBI030

**Grade:** 7

**Title:** Its so old! Bread Mold

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

**Project Number:** MBI031

**Grade:** 8

**Title:** Does temperature affect seed germination?

**Abstract:** Title: How Does Temperature Affect the Seed Germination of a Radish Seed? The purpose of my project is to see if temperature affects the seed germination of a radish seed. I'm doing this to find the best environment to plant a seed in. I'm going to test this by placing the radish seed on a damp bleached paper and paper plate and place it in a Ziploc bag. Then label all the bags and place them into 3 different environments, one next to a heater, one in front of a window and one outside. I think the one in front of the window will grow fastest.

**Project Number:** MBI032

**Grade:** 7

**Title:** Plants Breathe, Too

**Abstract:** What I am trying to discover is how plants can live with petroleum jelly on it. What I did was get three of the same plants and put petroleum jelly on two of three of the plants. My results where plant (b) lived better with the petroleum jelly on the top of it. Plant (a) did live long off of its natural recourses but not as long as plant(b). Plant (c) didn't live long at all it died the fifth day that we had it. I was able to draw that plants can live better with petroleum jelly on the top of it. Even though I didn't support my hypothesis I still learned a lot from this experiment. What I have learned is that plants with petroleum jelly on it live longer than the plants with out petroleum jelly on it.

**Project Number:** MBI033

**Grade:** 7

**Title:** An Oily Mess

**Abstract:** The purpose of this experiment was to find out what dish detergent worked best in cleaning oil off of feathers. I hypothesized that Dawn probably does work the best for cleaning oil off of birds. To test my hypothesis, I weighed duck and goose feathers before dipping them in oil and cleaned the duck and goose feathers with Dawn, Palmolive, and Full Circle, and water I let the feathers dry and weighed them again to see how much weight they had gained. My results were that Dawn worked the best for duck and Full Circle worked the best on goose.

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**Project Number:** MBI034

**Grade:** 8

**Title:** The Effect of UV Rays on Yeast

**Abstract:** The purpose of my study was to see if yeast grows differently when exposed to ultraviolet light and if it can be protected by sunscreen. UV sensitive yeast was plated onto 30 petri dishes. Ten were used as a control group (no UV light exposure), 10 more were exposed to UV light with no sunscreen and the last ten had SPF 30 sunscreen placed on the lids. These were put under a UV light for 5 minutes. All plates were then put in the dark incubator for 24 hours at 37°C. The dishes were then examined to see how many yeast cells grew. There was a great amount of contamination. Because of this, the experiment will be done again before the science fair.

**Project Number:** MBI035

**Grade:** 8

**Title:** Fruit Fly Gene Mutation

**Abstract:** For my SciTech and 8th grade science project I have tested the eyes of the fruit fly to determine where gene mutation occurs to produce certain color pigments in the eyes. Five different eye pigment samples were chosen to be tested and broken down into simple gene pigments, and the amount of simple gene pigments was recorded. It was determined that in each sample the gene mutates before a different pigment in the chemical reaction that occurs in a gene before they react to produce a certain color in the eye that is not natural.

**Project Number:** MBI036

**Grade:** 8

**Title:** Mold Growth on Bread

**Abstract:** The title of my investigation is Mold Growth on Bread. I have observed that mold grows differently in different environments. The purpose of this investigation is to determine whether mold grows better in different environments. Put bread in a refrigerator, on a counter, and outside to see what environment grows mold best. My hypothesis was supported by the data. The bread on the counter grew the most mold and the bread in the refrigerator grew the least.

**Project Number:** MBI037

**Grade:** 7

**Title:** Pollution & its effects on plants

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

**Project Number:** MBI038

**Grade:** 7

**Title:** Does an Inexpensive HomeMade Fertilizer Work Better

**Abstract:** Fertilizer is necessary for crops worldwide. People would welcome cheaper organic alternatives to expensive industrial fertilizer. This experiment tested a cheap homemade fertilizer against market-dominant Miracle-gro. The experiment did not support the hypothesis that Miracle-Gro will perform better. I applied a mixture of organic and household chemicals and minerals to three pots containing wheatgrass sprouts: 1) Homemade; 2) Miracle-Gro; 3) Control (no fertilizer), and controlled light and water. After three weeks, the Homemade

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fertilizer was superior to Miracle-Gro and Control. The experiment shows farmers and gardeners that less expensive fertilizers can replace expensive petroleum-based commercial fertilizers

**Project Number:** MBI039

**Grade:** 8

**Title:** The Small World of Macro-invertebrates

**Abstract:** The purpose of the experiment was to find out how factors such as pH can have an effect on the macro-invertebrate population. The procedure is as follows: First, test the pH in a section of a river or a stream above the pollution source. Second, use the kick net to collect macro-invertebrates from under rocks and decaying leaves. Third, repeat steps 1 and 2 in an area that is exposed to the pollution source. Station 1 had a pH of 8.5, and 94 macro-invertebrates were collected. The results show for Station 2 that the pH was 6.5 and 5 aquatic macro-invertebrates was recorded. With this data, it can be concluded that acidity in a stream system can decrease the amount of aquatic macro-invertebrates that thrive there.

**Project Number:** MBI040

**Grade:** 8

**Title:** Beneficial Bacteria

**Abstract:** In my project, I tested different yogurts to see which one had more beneficial bacteria. My purpose was to help people find a healthy yogurt. I hoped to prove that one yogurt had more streptococcus thermophilus and lactobacillus bulgaricus (good bacteria). My procedure took 2 days. First, I had to preheat milk. Then, add yogurt. Next, I set the mixture on a griddle for 12 hours. In the morning, I tested the yogurt's pH. The higher the pH, the thicker it is. Dannon was first, then Yoplait, Weight Watchers, Breyers and Giant Eagle tied, and then Stonyfield Farms.

**Project Number:** MBI041

**Grade:** 8

**Title:** Will different types of bread grow different types of mold?

**Abstract:** For my 8th Grade science fair project I want to see if different kinds of breads will grow different kinds of molds. I chose this because molds are everywhere in the world and pretty much everything grows mold. I took rye, white, wheat, and pumpernickel bread and put 4 drops of water of each one of them, then I placed them in bags and let them sit on a shelf. I'm currently waiting for the results.

**Project Number:** MBI042

**Grade:** 7

**Title:** Do ladybugs affect plant growth?

**Abstract:** In this experiment I intend to discover whether ladybugs affect the growth of a plant. After obtaining my ladybugs and geranium plants, I will separate the eight plants evenly into four butterfly enclosures. Then I will put 50 ladybugs each into half of the enclosures and let the plants grow for three weeks. I will measure the plants every two days. I have not completed my experiment and I cannot give my data or conclusions yet.

**Project Number:** MBI043

**Grade:** 7

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**Title:** Hydroponic Mediums and Bean Growth

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

**Project Number:** MBI044

**Grade:** 7

**Title:** Upside-down Plant Growth

**Abstract:** The purpose of this investigation is to determine if plants hung upside-down will grow taller than the plants hung right-side up. First I planted seeds in each pot, and hung ten pots right-side up and ten pots upside-down, then I checked their height after six weeks. The upside-down plants grew most in height, and the rightside-up plants grew the least in height. The upside-down plants grew the most in height because gravity pulled the seeds closer to the surface, and the rightside-up plants had gravity pushing them away from the soil's surface.

**Project Number:** MBI045

**Grade:** 8

**Title:** Hair Growth

**Abstract:** How many weeks prior to getting hair colored should people cut their hair? This project is to learn if hair growth is greater immediately following a haircut so those getting color treatments could maximize the color benefit through the timing of their cuts. Nine subjects got haircuts. Hair was measured in six places weekly. The growth was recorded. It is determined that hair grows more during the first week than any time thereafter. In conclusion, those getting color treatments should get cuts or trims at least three weeks prior to the coloring to maximize the length of time between treatments.

**Project Number:** MBI046

**Grade:** 7

**Title:** Magnified sunlight for plants

**Abstract:** The purpose is to find the effect of fresnel lenses on plant growth. To do so I cut a hole into each box then taped a Fresnel lens or a piece of overhead transparency over the hole. I then planted a seed in each cup and watered them. I placed 5 cups in each box and placed each box 25cm away from the window. I recorded growth of plants daily for 2 weeks. My hypothesis was fully supported because the magnified plants grew 52% taller.

**Project Number:** MBI047

**Grade:** 7

**Title:** How Does Climate Affect Grass Growth?

**Abstract:** The purpose of the investigator's project was to see how climate affects grass growth. The investigator tested grass growth in pots that were subjected to cool temperatures. Three pots were watered daily and three pots were watered every four days. The remainder of the pots were placed in the sun. Three of the pots in the sun were watered daily and the remainder of the pots in the sun were watered every four days. The height of the grass was measured after three weeks. The investigator concluded that the grass that grew in the cool, wet climate grew the tallest

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**Project Number:** MBI048

**Grade:** 7

**Title:** Comparison: Commercially Available Soils

**Abstract:** Gardeners have limited data comparing commercially available soils. This experiment was intended to provide a comparison of four commercially available soils. Using grass, wildflower, and tomato seeds, plant growth in each of four soils was compared. Temperature, humidity, light, and water were standardized for each sample. Measurements of growth were taken weekly for five weeks. The organic soil performed best on the grass and wildflower seeds. The most chemically enhanced soil performed best with the tomato plants. This research suggests the chemically enhanced soil enabled early rapid growth, but the organic soil provided better sustained growth.

**Project Number:** MBI049

**Grade:** 7

**Title:** Miracle Grow

**Abstract:** The purpose of this experiment is to figure out if regular soil works better than miracle grow. My hypothesis was I think miracle grow will work better than regular water. My outcome was that miracle grow did work better than regular water. In conclusion miracle grow worked better than regular water because it grow more plants than the regular water.

**Project Number:** MBI050

**Grade:** 7

**Title:** Plant Growth: Not Just Water

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

**Project Number:** MBI051

**Grade:** 7

**Title:** Growing Plants Under Colored Lights

**Abstract:** The purpose of this experiment was to determine which color of light grows lima beans the best. My hypothesis was that the blue or red light would grow plants the best and that the green and black would have the least amount of growth. To test this hypothesis I constructed six boxes with six lima bean plants. I then placed a different colored light in each box. I measured the growth of each plant every other day for 22 days. The results of my experiment were as follows: the blue light grew the most and the green and black lights grew; however, the health of the plants was poor.

**Project Number:** MBI052

**Grade:** 7

**Title:** The Effects of Spices on Bacteria

**Abstract:** The purpose of this investigation is to see if different types of spices kill bacteria. The spices chosen are garlic and cayenne pepper. This was done by liquidating and sterilizing spices, with SDF, sterile water, and the spice solutions. .1 mL of non-pathogenic e. coli was added on agar plates, and they were permitted to sit overnight. Garlic 1mL killed the most bacteria, garlic .1mL came in second, and cayenne pepper .1mL came in a close third. However, cayenne pepper 1mL came in a far last with 1136.4 e. coli colonies, and unusually high number. The hypothesis was supported.

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**Project Number:** MBI053

**Grade:** 7

**Title:** More Harm Than Good

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

**Project Number:** MBI054

**Grade:** 8

**Title:** Cell Phone Exposure and Carbon Dioxide Production in Yeast

**Abstract:** Recent studies indicate possible impacts on living organisms due to electromagnetic radiation from cellular telephones. To further investigate this question, live yeast cultures were exposed to various cellular telephones. The carbon dioxide production levels of the yeast was used to measure whether or not impact was occurring due to cell phone proximity.

**Project Number:** MBI055

**Grade:** 8

**Title:** Seed Size vs. Germination Rate

**Abstract:** The purpose of this experiment is to find out if there is an effect of seed size on germination rate. The Procedure is to collect five seeds that are the same types but are different sizes. In this experiment, it was sunflower seeds. Measure all of the seeds both length and width. Mark each jar with the seed size. Put 4ml of soil moist in all five jars. Put 30ml of water in the jar and let the soil moist absorb the water. Plant all five seeds in the clear baby food jars ¼ inch deep. Water the seeds 5ml every three days. Seed number one was thirteen millimeters long and eight millimeters wide. Seed number two was eleven millimeters long and six millimeters wide. Seed number three was ten millimeters long and five millimeters wide. Seed number four was nine millimeters long and four millimeters wide. Seed number five was eight millimeters long and four millimeters wide. The data shows that the seed size does not always affect the germination rate. Seed number two sprouted before seed number one and seed number one and four sprouted at the same time. The conclusion is that seed size does not affect the rate of which the seeds germinate. The larger seed does not always sprout before the smaller seed and the smaller seed does not always sprout before the larger seed.

**Project Number:** MBI056

**Grade:** 8

**Title:** Which fertilizer will cause pansies to grow the best?

**Abstract:** Fertilizers are known help plants grow. For my 8th grade project I am going to take 3 different fertilizers and see which fertilizer brand causes pansies to grow the best.

**Project Number:** MBI057

**Grade:** 7

**Title:** Clorox Vs. Lysol

**Abstract:** The purpose of my experiment was to test to find which brand of disinfectant wipes, Clorox or Lysol, kill the most bacteria. I hypothesized that Lysol would work better than Clorox disinfectant wipes. The results were as follows: When I tested them on the student desks Lysol killed more bacteria. When I tested them on the doorknob Lysol killed more again. When I tested them on the computer mouse Clorox killed more bacteria. So, Lysol killed more bacteria than Clorox 67 percent of the time.

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**Project Number:** MBI058

**Grade:** 8

**Title:** Protein Pineapples

**Abstract:** I picked this project because I wanted to see what type of pineapples to mix with gelatin. My project will show how the pineapple protein will react to the gelatin. I plan on getting three types of pineapples: fresh pineapples, canned pineapples and frozen pineapples. Then I will get 3 clear gelatin packs and follow the directions on the back. Before I put the gelatin in the fridge, I'm going to put the 3 different pineapples in different bowls of gelatin that I made. I think that the fresh pineapple will mix into the gelatin better than the other pineapples will.

**Project Number:** MBI059

**Grade:** 7

**Title:** The DNA Duplication Theory

**Abstract:** For my DNA theory, I researched topics surrounding my theory to get proof and a better understanding of my topic. I researched from the internet, DNA books, Science books, and Math books to acquire the information I need. It resulted by finding identical twins have the same DNA and parallel universes could have organisms exactly like ours. We can already manipulate an organism's DNA, and scientists have identified all human genes, which mean there are a finite number of combinations of DNA. From the aforementioned findings, my theory is proved and I will be able to breed generations of cyanobacteria.

**Project Number:** MBI060

**Grade:** 7

**Title:** Bring The Coffee To The Pot

**Abstract:** My question I am going to ask is that can coffee grounds and egg shells help plant growth? I counted 36 containers. Then I poked a hole on the bottom of each container. Then I placed 12 containers on each of the serving trays. I placed 200 ml of soil and a Mung bean in each container with about 5 cm deep into the soil of each container. I added 30 ml of water to each container. 12 container were just watered: 12 with egg shells; 12 with coffee grounds.

**Project Number:** MBI061

**Grade:** 7

**Title:** Frogs

**Abstract:** The purpose of this experiment was to determine if the frogs in my backyard are similar in size to the average frog size in Pennsylvania. From my research I hypothesized that the frogs in my backyard would be similar in size to the state frog averages, with the bull frog being the largest and the tree frog being the smallest. To test my hypothesis, I collected samples of tree frogs, common frogs, and bull frogs in my backyard. I then kept them in a tank, so as not to catch and measure the same frog twice. I then measured them twice to ensure that my measurements were accurate. I then calculated the average to see if the average size of the frogs in my backyard are similar to the frogs of Pennsylvania. The results of my experiment were that yes the frogs in my backyard are similar in size to the average frog sizes of Pennsylvania.

**Project Number:** MBI063

**Grade:** 8

**Title:** Hand Sanitizer vs. Antibacterial Soap

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**Abstract:** In this experiment, I will compare hand sanitizer to antibacterial soap, to see which one kills the most bacteria for a cleaner and healthier hand. I did my experiment because of my father, who is paranoid of bacteria on his hands. My data is still to be collected. I swipped bacteria with a cotton swab and applied it to agar in a petri dish. Next, I let the bacteria grow and then applied hand sanitizer and antibacteria soap compared to before I applied it.

**Project Number:** MBI064

**Grade:** 8

**Title:** Taste Bud Test

**Abstract:** People always say that boys are better than girls at everything. Is this true also with taste? I tested twenty students (ten females and ten males) between the ages of twelve and thirteen using six solutions of vinegar and water, salt and water, and sugar and water. To complete this experiment, the subjects dipped the Q-tips into the water and told me whether or not they could taste the substance in the water. In conclusion, I found that the females were able to taste more of the substances than the males.

**Project Number:** MBI065

**Grade:** 7

**Title:** Which Root Shall I Take?

**Abstract:** My topic is tropism. The reason I chose this project is because it caught my interest. My problem was trying to find out if I could reverse the direction the roots grow in my homemade seed germinator. I hypothesized I could. During my project, I used bean seeds verses radish seeds. What I had to do for my project was build a seed germinator and put the seeds inside it. After the roots in the seed germinator measured 2.5cm and observing them, I then turned the germinator around upside down. My project did turn out the way I expected.

**Project Number:** MBI066

**Grade:** 7

**Title:** Does Sunlight Affect Mold on Bread?

**Abstract:** This investigation is to determine if bread would mold faster in sunlight or darkness. I put one piece of bread in each baggie for a total of ten baggies. Five of them I labeled S1 - S5 which stands for sunlight. Then I labeled the other five D1 - D5 which means darkness. I put S1 - through S5 on a sunlit edge patio. D1 - D5 in a closed bread drawer. I checked them for mold everyday for twenty days. Overall the D1 -D5 molded more. As you can see, it's not really a good idea to put bread in a bread drawer.

**Project Number:** MBI067

**Grade:** 8

**Title:** The Effect of Soda on the Heart Rate of Daphnia

**Abstract:** The reason why I chose to do this experiment is because I thought it would be interesting to work with daphnia. The procedure for my experiment is very simple. First I set up my experiment, then I added the daphnia to the liquid I was testing, next I counted the daphnia's heart and fianly after finishing my testing I cleaned up everything I used. My data is order from least to greatest is ginger ale, Pepsi, Mountain Dew, Coca-Cola Zero, Coca-Cola, and Pepsi Max. My conclusion is that the increase in the heart rate was not based on the amount of caffanine alone.

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**Project Number:** MBI068

**Grade:** 7

**Title:** Effect of Caffeine on Gammarus?

**Abstract:** Caffeine is used as a stimulant and added to many soft drinks. However, caffeine is also associated with heart problems and possibly other health problems. This work intended to find if changes in heart rate could be measured in Gammarus when placed in caffeine. The heart rate of the Gammarus was measured in distilled water and then again in a prepared caffeine solution. In all ten trials concluded that the heart rate increased in the caffeine environment. Future work may include using other animals, or using different caffeine supplements.

**Project Number:** MBI069

**Grade:** 7

**Title:** Space Basil vs. Earth Basil

**Abstract:** The purpose of this investigation was to see if seeds that have gone to space grow differently than seeds that have stayed on earth. I assembled a terrarium and grew cinnamon basil that stayed on Earth. The Earth seeds grew rapidly and much taller than the space seeds. Taking seeds into space to grow may not be a good idea.

**Project Number:** MBI070

**Grade:** 8

**Title:** Energy Drinks Vs Heart Rate

**Abstract:** In order to begin testing I will need to purchase three energy drinks and one soft drink. Then I will need to buy Hyallela Azteca from wards scientific. I then need to make one, five, and ten percent dilutions of all four drinks. After that I will put the Hyallela Azteca in the dilutions for ten minutes. I will do this ten times for each product. After five minutes, the Hyallela Azteca will be taken out of the dilution and put under a microscope so the heart beats could be counted.

**Project Number:** MBI071

**Grade:** 7

**Title:** Plant Jam

**Abstract:** The problem I wanted to figure out is to see if plants respond to music. I placed 24 plants under my bedroom window. I played Classical music for three hours a day. Next I placed the other 24 plants under my parent's bedroom window. The windows are on the same side of the house and the plants in both groups received the same water daily. The plants responded to the Classical music and grew taller.

**Project Number:** MBI072

**Grade:** 7

**Title:** Stain, Stain, Go Away.

**Abstract:** Five acrylic and five resin composite teeth will be put into seventeen bottled beverages, water, Diet Pepsi, Diet Mountain Dew, Diet Sierra Mist, Diet Caffeine Free Pepsi, Caffeine Free Pepsi, Mountain Dew, Sierra Mist, and Pepsi, each carbonated and flat for a forty-eight hour period. After which, they will be taken out and allowed twenty-four hours to dry. Then, I will match the teeth's current color to a Vita-shade guide. Finally, I will put the

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teeth back into the beverages, making sure to put them in the same beverage again, and repeat the procedure, ten times.

**Project Number:** MBI073

**Grade:** 8

**Title:** Colorful Chlorophyll

**Abstract:** I measured the height of bean sprouts to learn if food coloring effects the speed of plant growth. My hypothesis was if the control bean sprout is taller than any of the colored bean sprouts, then food coloring stunts bean growth. For experimentation, I had four pots with gravel, soil, and three types of seeds planted; alfalfa, pinto, and mung. When watered with 100 ML every other day, three of the plants had two drops of blue, red, or yellow food coloring added; the remaining pot was the control. Once the seeds began growing, I measured the height of the plants with a metric ruler and recorded every day. The Control sprouts were the tallest, then the yellow variable, then the red variable, and lastly the blue variable.

**Project Number:** MBI074

**Grade:** 8

**Title:** How does aerosol affect plants?

**Abstract:** In my experiment, I am exposing lima bean plants to different amounts of aerosol to see if the aerosol has any affect on the plants. I will be doing this by keeping the plants in CO<sup>2</sup> chambers and exposing one chamber full to aerosol once a day, one once every three days, one once every five days, and one chamber will not be exposed to aerosol at all. I am conducting this experiment because I know that aerosol affects our ozone layer, but was wondering if it had any affect on the environment, and I am interested to find out.

**Project Number:** MBI075

**Grade:** 7

**Title:** Buzz Buzz

**Abstract:** My question was: do honeybees prefer a certain color when finding a food source? I hypothesized that the honeybees will prefer the brighter colors to the darker colors. My procedure consisted of mixing the sugar water for the flowers, cutting flowers out of colored construction paper, collecting water bottle caps and putting the sugar water in them, and recording data for 45 minutes each. My data was that the brighter colors were favored more than the darker colors. Since bees see in UV light, the brighter colors, such as white and yellow make the petal lines more visible. After my three trials, I concluded that my hypothesis was right, white and yellow did have the most bees arrive to them.

**Project Number:** MBI076

**Grade:** 7

**Title:** Related Fingerprints

**Abstract:** The purpose of the experiment was to prove, or disprove, that fingerprints are hereditary. There are seven different kinds of fingerprints: loop, double loop, whorl, pocked loop, mixed, arch, and tentarch. The first step of the experiment was to use a specially designed set of note cards to collect individual fingerprints. One hundred twelve fingerprints from more than 27 families were collected. They were classified and loaded onto a computer. The results were positive. Counting a child's mixed fingerprint as part of both parents, 95% of the children shared their parent's fingerprints. This study demonstrates fingerprints are hereditary.

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**Project Number:** MBI077

**Grade:** 7

**Title:** Mice and Mazes

**Abstract:** The purpose of my project is to test my three mice to see if mice complete mazes faster in the morning or at night. I'll build a maze for the mice to run through and I'll time them to see how long it takes for them to run through to the end. I'm doing this project to learn more about mice and which time of day they are most active. I think that when I test them in the morning and at night and compare the two they would have completed the maze faster at night.

**Project Number:** MBI078

**Grade:** 8

**Title:** Dog Intelligence

**Abstract:** The purpose of this experiment is to discover how smart my dog is and to understand the dog's mind. The procedure to perform this experiment included testing the dogs with many different skill tests and recording each dog's behavior and score for every test. All test results were compared to determine the test that had the widest and lowest variation in scores and the dog with the best overall score. The middle aged dog did better overall than the oldest dog on the skill tests. In conclusion, dog intelligence does seem to differ according to the age of the dog.

**Project Number:** MBI079

**Grade:** 8

**Title:** Pants and Pollution

**Abstract:** The purpose of this experiment is to demonstrate how damaging some common pollutants can be on plant life. There were five plants in the experiment, one was watered with 30ml of just water a day and the other four were watered 30ml a day of common pollutants mixed with water. The pollutants were acid mine drainage, phosphates, pesticides, and oil. This was done once a day for ten weeks. After about six weeks into the experiment the plant watered with pesticides started to look unhealthy. By the time the experiment was over the pesticide plant had less than half as many leaves as the healthy plant with just water and it was almost dead. The acid mine drainage plant looked about the same. The plant with phosphates and the plant with oil were a little bit unhealthy and they both had about 20 less leaves than the healthy plant with just water. This experiment proves that pesticides and acid mine drainage are the two most harmful common pollutant to plants.

**Project Number:** MBI080

**Grade:** 8

**Title:** What affect does pH have on protozoa growth?

**Abstract:** For my 8th grade science project, I am testing to see what effect does pH have on protozoa growth. I will set up this experiment by placing protozoa in containers and by adding increasing amounts of pH to the containers each day. I will record my results in a data spread sheet.

**Project Number:** MBI081

**Grade:** 7

**Title:** The Effects of Water Quality on Plants

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**Abstract:** My project is to test if the quality of water used to water plants makes a difference in plant growth. I planted 45 seeds and divided the plants into three groups of 15. I watered each group with a different water source: Reverse Osmosis, Tap Water, and Fish Tank Water. I found that the Fish Tank water had the greatest affect on the plant growth.

**Project Number:** MBI082

**Grade:** 8

**Title:** Effect of Saltwater on Seed Germination

**Abstract:** In numerous places throughout the world, saltwater is plentiful and freshwater is scarce. In today's economy, any nation would be glad to find a cheaper alternative water supply. If some food crops were able to grow just as effectively with saltwater than regular water, this also could help aid those nations in dire need. Are some crops able to grow and prosper as efficiently with saltwater than with freshwater? Would saltwater have to be diluted in order to grow the crops? Several concentrations of laboratory prepared saltwater were tested on tomato seeds and the germination rates were measured.

**Project Number:** MBI083

**Grade:** 8

**Title:** Which Fruit Has The Most Water?

**Abstract:** Which fruit has the most water? A pear, an apple, an orange, and a banana were weighed separately. Next, each fruit was dehydrated and then weighed again. The fruit with the greatest difference between the before and after weights is the fruit with the most water. The apple has the greatest amount of water.

**Project Number:** MBI085

**Grade:** 7

**Title:** The Nerve Of My Basil

**Abstract:** I wanted to see which type of soil, neutral, acidic or basic, would be best to grow basil in. I created an acidic solution and basic solution using distilled water, vinegar, and baking soda. I planted the basil seeds and watered them daily, controlling the environment and water amounts. The neutral soil was the best growing medium.

**Project Number:** MBI086

**Grade:** 7

**Title:** Effect of pH on Algae Growth

**Abstract:** This experiment examined the effects of pH level on the growth of algae. Subcultures of chlorella algae were grown in 5 pH conditions selected to cover a range that might occur in polluted rivers. After a one-week baseline, algae growth was tracked over a two-week period while pH levels were manipulated. Analyses revealed that algae multiplied rapidly in more basic pH conditions (pH 8.5, 10.0) and declined sharply in the most acidic condition (pH 4.0). Results show that pH does affect algae growth, a finding with implications for studying the effect of chemicals on the health of a river's ecosystem.

**Project Number:** MBI087

**Grade:** 8

**Title:** Microwaved Yeast

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**Abstract:** The purpose of my study was to see if the growth of yeast that is placed in front of a running microwave will be more affected than if it is placed on top of the microwave or if it is affected at all. 30 petri dishes were plated with yeast; 10 top, 10 in front, and 10 control. Most of my plates got contaminated so the study will be repeated before the science fair.

**Project Number:** MBI088

**Grade:** 8

**Title:** The eyes have it

**Abstract:** This experiment test the reaction of birds to different types of eye. This experiment is done using no predator cutout, a predator cut out wiht no eyes, painted eyes and reflective eyes.

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**Project Number:** MCH001

**Grade:** 7

**Title:** Does the size of a container affect the rate at which water evaporates?

**Abstract:** For my seventh grade project and sci-tech, I am testing to see whether or not the size of a container affects the rate at which water evaporates. I completed this experiment by setting out four containers of different sizes for ten separate twenty four hour periods. This led to container one evaporating an average of 4.2mL a day, container two evaporating 14.9mL, container three averaging 8.3mL, and container four averaging 4.6, thus leading to a conclusion that if the container is wider, it will have a faster evaporation rate.

**Project Number:** MCH002

**Grade:** 8

**Title:** M&M's Heated and Cooled!

**Abstract:** Purpose: To find out what would happen to an M&M's coating when wet and when warmed. Hypothesis: I think the color will just leak off of the M&M when it is wet, and I don't think anything will happen when it is heated. Procedure: 1. Set up experiment. 2. Wet each M&M separately (each M&M, 6), let sit for 5 minutes. Record observations. 3. Heat each color M&M on a plate(6), in the microwave for 5 minutes. Record observations. Conclusion: My hypothesis was partially correct, but there was an effect on the heated M&M's.

**Project Number:** MCH003

**Grade:** 8

**Title:** Tie Dye Retention

**Abstract:** Which fabric makes the brightest tie dye? I use 9 kinds of fabrics. To make sure the color wouldn't fade when you washed and dried them, I washed and dried them 3 times. The four best fabrics were 100% cotton, the socks, canvas, and flannel.

**Project Number:** MCH004

**Grade:** 8

**Title:** Are You Dense?

**Abstract:** In my experiment, I tested different liquids to see which liquid was the densest. Density is a physical property of matter to describe the thickness, or "heaviness" of an object. I got five glasses and placed different liquids in each of the glasses. I then dropped an egg in each glass to test the density. The eggs would either sink or float. If the egg floated it was less dense than the liquid. If the egg sank it was denser than the liquid.

**Project Number:** MCH005

**Grade:** 8

**Title:** What removes gum from carpet?

**Abstract:** The purpose of this experiment is to help anyone who gets gum stuck in carpet so they know what the best household liquid is to remove it without damaging the carpet. To conduct the experiment, chew one piece of bubble gum and let stand for one minute. Try to take gum off with fingers. If the gum doesn't remove, pour vinegar on the gum. Use a napkin and remove the gum. Repeat this two more times with rubbing alcohol and hydrogen peroxide. The data is the average time it took to remove the gum. Vinegar took 45 seconds. The average time it took to remove the gum with rubbing alcohol was 63 seconds. The average time it took to remove the gum with hydrogen peroxide was 35 seconds. Hydrogen peroxide

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removed the gum from the carpet. This would be the best liquid to use when removing gum from the carpet.

**Project Number:** MCH006

**Grade:** 7

**Title:** Soda Fizz

**Abstract:** The purpose of this study is to see how much carbonation soda loses when it is shaken. I am testing five different kinds of soda (SevenUp, Seltzer water, Mountain Dew, Wild Cherry Pepsi, and Diet Pepsi). I poured 50 mL of each soda into a cup, put the cup on a scale and check its mass in grams. I shook it for thirty seconds, and then take the lid off for another thirty seconds. Then I repeated this process. This was done for each liquid 10 times. My conclusion is that all of the liquids seem to have lost about the same amount of mass during this process.

**Project Number:** MCH007

**Grade:** 8

**Title:** Growing Crystals Experiment

**Abstract:** Crystals are a beautiful types of rock. This experiment was to see if different lights could affect crystals growth. There were three types of lightings used. Sample rocks were divided into three containers. Then a crystal solution was equally added into each container. This experiment took twelve days. It was the container under the fluorescent light grew the most an darkness grew less.

**Project Number:** MCH008

**Grade:** 8

**Title:** Green Bags, Do They Work?

**Abstract:** Green Bags are used for saving food from spoiling. The reason I'm doing this project is because a lot of products are falsely advertised on television, and when you buy them it usually doesn't work. I am doing this project to make people's life easier in saving produce. I think the green bags won't work because my family has bought a lot of products that have been advertised on television and they didn't work as the advertisement said they would. So my mom bought these green bags worth \$11.59. I don't want my mom to have wasted her money on something that doesn't work. Procedure: 1. I'm going to get all my materials ready 2. I am going to observe the lettuce and bananas 3. I am going to put 3 bananas and 3 cabbages in green bags 4. I am going to put 3 bananas and 3 cabbages in plastic bags 5. I am going to observe the food every day 6. At the end I will compare how well the plastic bags work to the green bags Conclusion: The cabbage in the green bags actually got greener. In the plastic bag the cabbage was brown and slimy. The bananas in the green bags color did not change but they tasted like you just got them new. The bananas in the plastic bags turned brown and they were very soft.

**Project Number:** MCH009

**Grade:** 8

**Title:** Does air temperature affect the life span of soap bubbles?

**Abstract:** The purpose was to find out if air temperature affected the life span of soap bubbles. First, choose four locations to place the baby food jars. Next, label the jars with the location and use a thermometer to find the temperature of that place. Record those temperatures and place the jars in their locations. After 15 minutes, get the jars out, and shake them each for 30 seconds and check the temperature. Then, place them back in their

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locations. Record when all of the bubbles pop. The data was not continuous. It varied with each trial. In trial 1, it took the room temperature jar 7 hours, outside was frozen before popped, freezer took 8 minutes, and refrigerator didn't pop after 24 hours. In trial 2, room temperature took 2.5 hours, in the freezer and outside they froze, and in refrigerator it never popped. In trial 3, the room temperature took 3.5 hours, 5.5 outside, the freezer solution froze, and refrigerator was 8.5 hours. In all trials, there was no pattern. The average for room temperature was 4.33 hours and refrigerator was indefinite. Outside and freezer jars both froze, so no average could be found. The cooler the air temperature the longer the life span of soap bubbles.

**Project Number:** MCH010

**Grade:** 7

**Title:** Which orange juice has the most vitamin C (Using iodine)

**Abstract:** The purpose of my project is to see what orange juices has the most Vitamin C in it. I am doing it because I like orange juice and I want to know which one is the best for my body. I am going to put a Providine solution in the orange juices and whichever turns from an orange to greenish brown has the most Vitamin C. I think that freshly squeezed orange juice will have the most vitamin C because canned juice and other varieties have a lot of sugar and that would take away from how much vitamin C that the juice has.

**Project Number:** MCH011

**Grade:** 6

**Title:** What Erodes Rock?

**Abstract:** Purpose: will different liquids erode rocks

Hypothesis: acid will erode more than the salt H<sub>2</sub>O, and the salt H<sub>2</sub>O more than the frozen H<sub>2</sub>O Procedure: all of the liquids & rocks in 6 different containers Conclusion: acid & salt H<sub>2</sub>O eroded the most

**Project Number:** MCH012

**Grade:** 7

**Title:** The Effectiveness of Various Binding Ingredients in Different Brands of Vit C

**Abstract:** It is necessary to purchase seven brands of Vitamin C. To simulate stomach acid, I will use a mixture of Sulfuric Acid and Distilled Water. A beaker filled with 500 ml of water will be heated to 37 degrees Celsius. A magnetic spinner will be used to simulate the stomach and in order to eliminate the variable of inconsistency. A vitamin will drop into the spinner. Once the vitamin itself was completely dissolved, the timer will be stopped and the pH taken. This process is repeated 10 times for every brand of vitamin.

**Project Number:** MCH013

**Grade:** 8

**Title:** Particle Size Chemistry

**Abstract:** Efficient treatment methods must be developed for ensuring the future availability of drinking water. The purpose of this project was to determine how particle size composition can be optimized to improve the performance of sand as a natural, inexpensive, sustainable water filtration media. Calibrated sieves were used to selectively remove specific particle size fractions from all-purpose sand. Permeation times, together with pH and calcium concentrations of filtered water samples were used to prove that the filtration rate of sand can

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be increased by 65% by removing the <150 micron particle size fraction (11.3% by weight), while maintaining pH buffering performance.

**Project Number:** MCH014

**Grade:** 8

**Title:** The Most Efficient Ice Melter

**Abstract:** The title of my project is "The Most Efficient Ice Melter." The purpose of this investigation is to determine which product melts ice the best. I hypothesized that sodium chloride will work the best. I froze ice in three pans and then placed one of the products (sodium, calcium chloride, sand) on the ice and let them sit for two hours and then measured the water. My hypothesis was not supported by the data. Calcium Chloride did the most ice melting.

**Project Number:** MCH015

**Grade:** 7

**Title:** Growing Crystals

**Abstract:** I am trying to discover if the amount of my solute, borax dissolved into the solvent, water will affect the way a crystal will form. I started with two jars but added a third. I put three different amounts of borax in the jars with 300ml of Hot water. The borax did not completely dissolve. This did not affect the growth of the crystals. The only thing that was affected was the size and shape because the undissolved borax was in the bottom of the jar not leaving enough room for the crystal to grow. I learned that the solvent will only take up so much solute and the rest just sits there. My hypothesis was not supported because I thought the crystals would not grow in an over saturated solution.

**Project Number:** MCH016

**Grade:** 7

**Title:** Apple Oxidation

**Abstract:** The purpose of my experiment was to see which preservative; lemon juice, orange juice, and/or water worked best to keep red and/or green apples from oxidizing. My hypothesis was that lemon juice would work the best, orange juice would come in second, and water would work the least. I also predicted that the apples' results would be fairly similar. My results showed that my hypothesis supported my data.

**Project Number:** MCH017

**Grade:** 8

**Title:** My Nails are Yucky

**Abstract:** I investigated this topic for a science class project. My hypothesis is that the nail in the highest concentration of acid will rust the fastest. I filled eleven plastic cups with five ounces of an acid-based solution, varying in concentration, which might resemble acid rain. I then placed a carbon steel nail into each solution. The nails were observed every twelve hours for one week. The nail in the lowest concentration of acid rusted the fastest. The data disproved my hypothesis. The opposite happened. For further experimentation, I could change the acid base, test it, and compare them.

**Project Number:** MCH018

**Grade:** 8

**Title:** Substitution

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**Abstract:** The purpose of the experiment was to test an alternative to baking powder. Baking soda and cream of tartar can be used as a substitute for baking powder. To complete this experiment, six batches of muffins with different ratios of cream of tartar and baking soda were baked. Five trials were completed, to collect an average weight, height, taste, color, and look for the different muffins. The average weight and height of muffins increased with amount of baking powder. Also, muffins with higher ratios of substitutes were harder. Substitutions are available but may not be the most palatable.

**Project Number:** MCH019

**Grade:** 7

**Title:** Affects of metal on water pH

**Abstract:** In this investigation I want to find out if metal in water affects the pH of the water. To do so test distilled water that has not been treated and distilled water that has been exposed to various kinds of metals for pH. I have not yet completed my investigation so can not analyze the data or come to a conclusion at this point.

**Project Number:** MCH020

**Grade:** 8

**Title:** Crazy Catalysts

**Abstract:** My experiment is testing the effects of a catalyst on chemical reaction times. I tested the effects by starting out with a simple chemical reaction between a specific sodium mixture and hydrogen peroxide. This reaction time was measured through color change. The reaction took about an hour and a half. After the reaction was over I completed the same steps again to have the same reaction, but this time I added an ammonium molybdate catalyst. This new reaction only took about two or three minutes. The catalyst greatly reduced the chemical reaction time.

**Project Number:** MCH021

**Grade:** 7

**Title:** Calories and Energy

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

**Project Number:** MCH022

**Grade:** 7

**Title:** Mtrls. That Clean Up Oil Spills

**Abstract:** The purpose of the experiment is to determine what materials best clean up oil spills. The following steps were performed to complete the experiment. First, fill the measuring cup with 600mL of water, and 200mL of motor oil. Second, place 141.7g of the absorbent material into the measuring cup for 20 seconds. Next, pull the absorbent material out of the cup and measure the remaining oil. Repeat the steps three times for each of the materials. The data showed that the cotton absorbed the most oil. Therefore, the conclusion supported the hypothesis—cotton would absorb the highest amount of oil

**Project Number:** MCH023

**Grade:** 6

**Title:** What is rust?

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**Abstract:** purpose-rust is called oxidation. Oxidation is the interaction between oxygen molecules.hypothesis-I think that if i use 2oz/.06kg of distilled water overtime it would make the nails rust.procedure-nails in container,pour distilled water,check nails when done.conclusion-if the nails will rust overtime it will prove the oxidation prosses works.

**Project Number:** MCH024

**Grade:** 8

**Title:** Eggshellent Absorption

**Abstract:** I tested to see why my hands prune. I always wondered why it happened but never tried to see why until now. I took two identical eggs and put them in vinegar then I put one egg in distilled water and one egg in corn syrup. My hypothesis was correct that the egg in distilled water would gain mass while an egg in corn syrup would lose mass. After the project I switched the eggs to see if they would change. It turns out tht they did.

**Project Number:** MCH025

**Grade:** 7

**Title:** Secondhand Plants

**Abstract:** I wanted to know if cigarette smoke is harmful to plants. I made a smoke machine. I grew 36 plants in the same environment. I exposed 18 plants to cigarette smoke for a set time daily for 15 days.The plants that were exposed to cigarette smoke were negatively affected.

**Project Number:** MCH026

**Grade:** 7

**Title:** Molecular Excitation of SpectrachromeCrystals

**Abstract:** UV rays are important to us, because they can be very harmful to skin cells, causing cellular damage (sunburn). Del Sol products have spectrachrome crystals that reveal their hidden colors when exposed to sunlight. With the increase of skin cancer, companies are looking for materials that block UV rays. It was hypothesized that darker materials are more likely to block UV rays than lighter shields. To obtain an answer, a spectrascope and UV view box were constructed, and 21 shields were tested on Del Sol products in 2 trials. The results show darker materials block UV rays better than lighter materials. Therefore, the hypothesis was correct.

**Project Number:** MCH027

**Grade:** 8

**Title:** Sugar Alert

**Abstract:** For this experiment, my question is how many teaspoons of sugar will it take to match the sugar level of the soda. I hypothesized that it would take 25 grams to match the sugar solution for both sodas. To test this experiment, I measured the cola with a hydrometer. Then, in a water solution I counted how many grams of sugar it took to equal the amount of sugar for the cola. I did the exact same thing for the Sprite. In the end, I got 25 and ahlf grams of sugar for the cola and 25 grams of sugar for the Sprite. I was surprised very much at the outcome of my experiment.

**Project Number:** MCH028

**Grade:** 7

## INTERMEDIATE DIVISION – CHEMISTRY

**Title:** Orange Juice and Vitamin C

**Abstract:** The title of this investigation is Orange Juice and Vitamin C. The hypothesis is fresh squeezed orange juice will have the most vitamin C. The procedures are: put 10 drops of starch solution in a flask, 20 drops of orange juice and 1 drop of iodine to the flask then swirl it. Keep adding drops of iodine, swirling after you add each drop. Record the number of drops. Fresh squeezed orange juice had the most vitamin C. Frozen juice came in second then the canned then cartoned.

**Project Number:** MCH029

**Grade:** 7

**Title:** The Effect of Antacids on the pH of Gastric juice

**Abstract:** Heartburn is a serious problem in America. One out of every three people suffers from heartburn, while about one out of every ten people has heartburn every day. This experiment was intended to find out which antacid will raise the pH of the gastric juice the most, and also the one that will work the fastest. The pH of the gastric juice was measured every twenty seconds for ten minutes after adding each antacid (8 antacids and water (control) were tested). This was done at 50mL 75mL and 100mL of gastric juice for 27 tests in all (16 hours of testing). It was found that of the antacids tested, Rolaids was the strongest antacid and Alka-Seltzer was the fastest-acting antacid.

**Project Number:** MCH030

**Grade:** 7

**Title:** The Effects of Flame-Retardants on Fabric

**Abstract:** Hypothesis: cotton flame-retardant fabric will take longest to burn. Polyester will take the shortest to burn. Procedures: 1. cut equal pieces of fabric from flame-retardant fabric and non flame-retardant fabric. 2. mix both solutions 3. soak drapery fabrics in solution and hang dry 4. test all fabric setting it at different heights over the source of the flame. 5. record data 6. repeat steps 4-5 for remaining fabric

**Project Number:** MCH031

**Grade:** 8

**Title:** Mixtures and Floatations

**Abstract:** The purpose of my project is to test the density of mixtures. I want to see if different mixtures will cause an object to float or sink. I am doing this experiment because I love to mix. I always mix different liquids and now I am doing it for a grade. I would like to test out how the weight of the object affects the way it floats or sinks. I believe that the perfect object to use in this experiment is a carrot or a strawberry. The reason why is because these nutritious snacks have enough density to test this experiment.

**Project Number:** MCH032

**Grade:** 8

**Title:** Does cooking affect Vitamin C?

**Abstract:** The purpose of this investigation is to find out how various cooking methods affect the vitamin C level of vegetables. Using a juicer I will pulverize a variety of different vegetables before and after cooking and test the Vitamin C level of each. Because I have not yet completed the investigation I can not analyze the data or come to a conclusion at this point.

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**Project Number:** MCH033

**Grade:** 8

**Title:** Enamel Erosion

**Abstract:** What erodes enamel off of teeth more? After I cleaned the cow teeth, I submerged them in Gatorade, Coke, Pepsi, and Orange Juice. I let the teeth sit for two days then changed the liquids. I did this repeatedly for six days. I weighed and recorded the measurements before and after soaking them. I subtracted the final weight from the initial weight and came to the conclusion that Gatorade is the worst for your teeth.

**Project Number:** MCH034

**Grade:** 7

**Title:** Is your mouth too acidic?

**Abstract:** This investigation deals with salivary pH. To conduct this investigation, pH strips were given out to the volunteers. Volunteers' pH was measured using pH strips and the pH levels were recorded. The average pH level for volunteers with braces was 7.5 and the average for volunteers without braces was 8. This data shows that people with braces have a more acidic salivary pH than people without braces. This suggests that people with braces should be more aware of their dietary habits to balance the acidity in their mouth.

**Project Number:** MCH035

**Grade:** 7

**Title:** Time For a Change... It's More Than Just Politics

**Abstract:** I studied four leading brands of disposable diapers to determine which brand provides the best leakage protection. My dependent variable is the amount of fluid leakage. My independent variables include diaper brand, wait time, and presence or absence of honey. My main controlled variables are type and amount of fluid, fluid temperature, and diaper position. None of my thirty-six diapers leaked after four hours and only two of my twelve diapers tested for ten hours had any leakage. My test results indicate there is virtually little difference in fluid leakage for up to ten hours.

**Project Number:** MCH036

**Grade:** 7

**Title:** Rust Removers

**Abstract:** The purpose of my study was to find if and what liquid can take rust off of untreated nails the best. I have made a surprising discovery that if nails are already rusted and sit in water for a little while, some of the actually comes off. HCl, which was my guess for the best rust remover, did the best and took off the most rust. Vinegar and ammonia actually produced even more rust onto the nails, and witch hazel and alcohol stayed the same. That was the purpose and how my project turned out.

**Project Number:** MCH037

**Grade:** 8

**Title:** ACID RAIN?

**Abstract:** My reason for doing this project is that I wanted to know, is snow too acidic for people. My hypothesis is that the snow and stream water is going to be a little bit more acidic than the distilled water. For my experiment, I tested 3 samples of distilled water, stream water, and snow water. I also tested 5 samples of newer snow and 5 samples of older snow.

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I found that snow water is more acidic than distilled water and stream water. I also found that new snow is more acidic than old snow.

**Project Number:** MCH038

**Grade:** 7

**Title:** Silica Gel's Impact on Humidity

**Abstract:** The experiment's purpose was to see if humidity levels in a container, with a glass of water, would reduce by adding packs of silica gel. The experiment involved a glass of water, a container, humidity indicator cards, and various silica packs. The control had no silica packs; and was used to find the average humidity level in the container. The glass set in the container for one hour. The indicator cards determined the results. This procedure was repeated twelve times, and every three times an additional pack was added. The data supported my hypothesis because additional packs reduced the humidity.

**Project Number:** MCH039

**Grade:** 7

**Title:** Color The Leaves

**Abstract:** In my experiment, I tested which leaves turn which colors. I cut the leaves up and put them in rubbing alcohol. I put the containers full of leaves and rubbing alcohol in a pan of hot water and timed it. In conclusion, I found that the Blue Beech leaf turned the most colors.

**Project Number:** MCH040

**Grade:** 7

**Title:** A pH Predicament

**Abstract:** I wanted to do this experiment because people get diagnosed with all types of diseases each day. I wanted to know if the pH affects how our stomachs react and how they digest chicken. I simulated hydrochloric stomach acid and tested how long it took for the chicken to be broken down. More acidic stomach acid broke the chicken down faster.

**Project Number:** MCH041

**Grade:** 8

**Title:** Water Treatment Techniques

**Abstract:** The purpose of this experiment was to discover which method for water treatment was the most effective. The procedure included testing the chemical levels and bacteria levels of samples of both river and distilled water before and after treatment, treating the water with a sand filter, water tablets, and boiling, and allowing bacteria to grow. The results showed that boiling killed the most bacteria and water tablets lowered the most chemical levels. The conclusion was that boiling was the most effective for killing bacteria and water tablets for chemical levels.

**Project Number:** MCH042

**Grade:** 8

**Title:** Acid Rain

**Abstract:** The purpose of this experiment is to find out if industrial areas have more acidic rain than rural areas. For my procedure, I collected snow from industrial and rural areas, tested the pH level three times then got the average. Repeated this 11 times for rural areas and 11 times for industrial areas. I found that industrial areas had a lower pH than rural areas

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meaning that rural areas had more acidic precipitation. My hypothesis was not supported because I thought that rural areas would have less acidity in their precipitation than industrial areas.

**Project Number:** MCH043

**Grade:** 8

**Title:** Temp. Effect on Viscosity

**Abstract:** Liquids have a property called viscosity, which is how resistant they are to flow. Most liquids will flow more easily when their temperatures are raised. Among shampoo, honey and syrup, which of these household products has the greatest change in viscosity due to a change in temperature? I believed that the syrup would have the greatest change in viscosity due to temperature change.

**Project Number:** MCH044

**Grade:** 7

**Title:** Got Juice?

**Abstract:** The purpose was first to confirm if the enzyme pectinase increased juice formation in apples. Next the hypothesis that sweetness was a predictor of juice formation was tested. Five varieties of apples were tested. Weighed amounts of chopped apples with and without pectinase were heated in a 60°C water bath for 15 minutes, and the formed juice measured. Sweetness was tested by adding Benedict's solution and observing the amount of red-brown precipitate. The Honey Crisp apple was the juiciest while the Fuji was the sweetest. High apple juice formation is not directly correlated to the sweetness of the apple.

**Project Number:** MCH045

**Grade:** 8

**Title:** Array of Colors

**Abstract:** Detectives often use chromatography to identify drugs from narcotics to aspirin in blood. My problem is what marker separates the best in rubbing alcohol or nail polish remover? Cut 30 paper strips 1 by 4 inches in area. Place a small dot of ink onto the line for 10 strips and repeat for the other two colors. Measure the distance of each ink component traveled from starting point. Repeated the experiment for each color. Data showed my hypothesis was correct. The Rubbing alcohol separated green ink the farthest. To further investigate see which dyes are used in colored candy coatings.

**Project Number:** MCH046

**Grade:** 7

**Title:** Green versus Regular Detergents

**Abstract:** The problem of my experiment is: Do green detergents work just as well or better than regular detergents? My hypothesis is that regular detergents will work better than green detergents. In my experiment, I used three green laundry detergents and three regular laundry detergents. I also used three green dishwashing liquids and three regular dishwashing liquids. I measured the time and how many milliliters of detergent it took to emulsify five milliliters of vegetable shortening. In conclusion, my experiment supports my hypothesis that regular detergents would work better than green detergents because regular detergents contain chemicals that clean more efficiently.

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**Project Number:** MCH047

**Grade:** 7

**Title:** Aqua Balance

**Abstract:** Using a containment chamber, I tested two types of water to see if heat would negatively affect the hardness and pH of water in a container.

**Project Number:** MCH048

**Grade:** 7

**Title:** Battery Longevity

**Abstract:** My project is to test which battery would last the longest and the battery that lasted the longest was Duracell. The battery that I thought would last the longest was Duracell so I was right of which battery would last the longest.

**Project Number:** MCH049

**Grade:** 7

**Title:** Does vitamin C reduce moisture loss in fruits?

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

**Project Number:** MCH050

**Grade:** 8

**Title:** Rusty Metals or Shiny Metals

**Abstract:** Purpose For my science fair project I want to find out what type of metals are affected by vinegar. Hypothesises I think that the stainless steel will not be affected by the vinegar because it is stainless. I think that all the other metals will be affected. Procedure  
1. gather all of your materials 2. pour 1 1/2 cups of vinegar into each beaker 3. place each metal in a seperate beaker 6. place each metal in a safe place 7. record data for 7 days

**Project Number:** MCH051

**Grade:** 8

**Title:** The Effect of Liquids on Sodium Polyacrylate

**Abstract:** I selected this topic because it seemed very interesting. By doing this experiment, I hope to prove that vodka will take the longest to absorb. First I put sodium polyacrylate in a bowl. Then I added the liquid. After I added the liquid, I timed with a stopwatch to see how long it takes for it to absorb. I had a lot of variations in my data. If I did this experiment again I would use different liquids. Overall it was a really fun experiment.

**Project Number:** MCH052

**Grade:** 8

**Title:** Colorful Chromatography

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

**Project Number:** MCH053

**Grade:** 8

**Title:** Natural vs. Synthetic

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**Abstract:** The purpose of my experiment was to find out if the natural fiber was stronger than the synthetic fiber. My problem was: "Are natural fibers more durable than the synthetic fibers? And which will deteriorate faster?" My hypothesis was that the natural fiber will be more durable, and the synthetic fibers will deteriorate faster.

**Project Number:** MCH054

**Grade:** 7

**Title:** To Burn or Not to Burn

**Abstract:** I experimented to find out which brand of fire starter logs burns the longest and leaves the least amount of ash and residue. I did this because I don't know much about these products and I'm interested in how they work. For this project, I measured the log to see the length, and I then cut it to the amount of centimeters that would equal 0.23 kg. I placed the log into the fireplace grate. After that, I inserted a sheet of aluminum foil under the grate to collect ash and residue. Next, I took a lighter and held it on the bottom edge of each log for about 15-20 seconds. I recorded the time when the log was lit. I waited for the log to stop burning, and I recorded the time again. I let the log cool and collected the ash and residue. The next day I took the ash and residue to school to weigh. I found that Log 1 burned for 306 minutes/ 1.35 kg and left 48 g of residue/ 1.35 kg. Log 2 burned for 330 minutes/ 1.35 kg and left 12.6 g of residue/ 1.35 kg. I concluded that Log 2 is overall the best log to use because it burns longer and leaves less ash and residue.

**Project Number:** MCH055

**Grade:** 8

**Title:** From Kitchen to Carburetor: Fuel for the Future

**Abstract:** The purpose of my project was to find out which vegetable oil (when made into biodiesel) makes the most efficient biodiesel. I hypothesized that canola oil would burn the cleanest. To perform this project, I made the oils into biodiesels by adding CH<sub>3</sub>OH and KOH to the oils and heating it for 60 minutes. Then, I tested each oil to find the specific heat using a calorimeter. The canola oil had the greatest overall specific heat

**Project Number:** MCH056

**Grade:** 7

**Title:** Which Litter Absorbs More Water?

**Abstract:** The purpose of this experiment is to find out if clay litters absorb more water than crystal litters. Fresh Step, Arm and Hammer and Tidy Cat clay and crystal litters will be tested. Cups with holes in the bottom will be filled with 75 grams of litter; 100ml of water will be poured into the cup. After thirty minutes the water that drips through the litter will be recorded. Sixty tests will be performed. The crystal litter absorbed 64% and clay absorbed 61% of the water. It provided evidence the crystal litters expanded and swelled more than the clay litter.

**Project Number:** MCH057

**Grade:** 7

**Title:** Keep the Heat In!

**Abstract:** The purpose of my project is to determine which material is the best insulator out of the four materials I chose. The four materials I used as insulators are cotton, wool, acrylic, and aluminum foil. Insulator is a material used to reduce the rate of heat transfer. Insulation works by slowing down the movement of heat from a hot space to one that is cooler. The key thing to remember is that insulation does not block the movement of heat, it just slows it down.

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**Project Number:** MCH058

**Grade:** 8

**Title:** Oil Through Thick And Thin

**Abstract:** Does the temperature of motor oil affect the viscosity? I answered this question by heating motor oil in a graduated cylinder to different temperatures, and then dropped a sphere in it. I timed the time it took for the sphere to fall. Then using the average time from each temperature, calculated viscosity. I expected that the oil at higher temperatures would have a higher viscosity rating, I was correct.

**Project Number:** MCH059

**Grade:** 7

**Title:** Which Toothpaste Whitens Best?

**Abstract:** People want white teeth so they will look their best. This experiment was designed to determine which toothpaste did the best job of whitening teeth. Toothpastes tested were Crest, Colgate, Aquafresh, and Arm & Hammer. Teeth were soaked in blueberry puree and coffee for three days and brushed with the toothpastes several times. Teeth were compared to a dental shade guide to measure color change. The experimenter's hypothesis was correct. Crest performed the best and Aquafresh was second best. If this experiment were repeated, the experimenter would use more stains and try to get teeth of the same original shade.

**Project Number:** MCH060

**Grade:** 7

**Title:** Apple Preservation

**Abstract:** The purpose of this experiment is to find out what citric fruit juice prevents oxidation the best while not altering the flavor of the apple. My hypothesis was that lime juice would work the best. The general outcome of my project was that lime juice worked the best, then tangerine juice, then lemon juice, then orange juice, then water, then last but not least, nothing. In conclusion, lime juice stopped oxidation the best while not changing the flavor of the apple.

**Project Number:** MCH061

**Grade:** 7

**Title:** Ice Cube Challenge

**Abstract:** I am trying to discover how the solutions freeze and melt. I checked on them often and melted them to get my results. My results were that the salt and vanilla solutions didn't freeze completely. All the other solutions did freeze. The vanilla was the first to melt and the plain water was the last to melt. I was able to draw a conclusion that the plain water, sugar, milk, vinegar, and food coloring solutions were able to freeze and melt normally. The salt solution wasn't able to freeze.

**Project Number:** MCH062

**Grade:** 7

**Title:** H<sub>2</sub>O Electrolysis

**Abstract:** The purpose of this experiment is to show how water electrolysis is conducted. I will also see if adding things to water changes how much they bubble. I will use saltwater,

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sugar water and plain water and check to see if they all bubble. I will use a 9-volt battery attached to two pencils to complete the electrolysis. I think that the plain water will make the most bubbles. I think this because the salt and sugar will make a reverse reaction and not make it bubble.

**Project Number:** MCH063

**Grade:** 7

**Title:** Does adding salt to water affect the rate at which the water will evaporate?

**Abstract:** For my 7th grade science project and SciTech, I conducted a science experiment to see if adding salt to water would affect the rate at which water will evaporate? I did it by adding water to 4 different glasses, and put different amounts of salt in each, and recorded how much the height of the liquid decreased in mm each day. I did 4, 3 day trials. The result was that the control (no salt) evaporated the 3rd most, 1 tsp evaporated most, 2 tsp evaporated 2nd most, and 3 tsp evaporated the least.

**Project Number:** MCH064

**Grade:** 8

**Title:** The Disappearing Act!

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

**Project Number:** MCH065

**Grade:** 8

**Title:** Drinks and urine pH levels.

**Abstract:** The purpose of this is to find out if different drinks affect the pH level of urine. Human subjects will be urinating in a cup when they wake up in the morning and then again after consuming one liter of a certain drink. This will happen four times. Wearing gloves and washing hands for 20 seconds under hot water with soap is a must when handling urine. I will be measuring the pH level from both cups every day. I have not yet completed my experiment. Therefore, I have minimal data, and cannot conclude anything about my project.

**Project Number:** MCH066

**Grade:** 7

**Title:** Ice Melters

**Abstract:** The purpose of my science fair project was to experiment by using five different compounds to determine what melts ice the fastest. By pouring the same amount of each agent, onto five separate pans of water, and having my sixth serve as my control; I was able to measure the amount of water every four hours, for twenty-four hours, to calculate which worked the fastest. I repeated my experiment on three separate days, concluding calcium chloride the winner every time. Calcium chloride, in its original state is a liquid; therefore it turned back into a liquid faster.

**Project Number:** MCH067

**Grade:** 7

**Title:** Which salt melts ice the fastest?

**Abstract:** The purpose of my science projects it to prove which salt will melt ice the fastest. I'd like to learn how salt reacts to ice and how fast it would melt. In my science project, I am going to put a pinch of salt on about 5 blocks of ice. One at a time I will write down every little

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thing that has happened to the ice and write down how long it has taken for the ice to melt. As the salt is on the ice, I think that the ice will melt for about 3 minutes and turn into a medium sized puddle.

**Project Number:** MCH068

**Grade:** 8

**Title:** Which Carpet Cleaner is Most Effective?

**Abstract:** Purpose: I wanted to know waht carpet cleaner actually takes out stains. I figured if I would test three different carpet cleaners, I would find the answer to my question.

Hypothesis: "Formula 409" will take out the stains the best. It states on the bottle that it will take out more stains. "Quality Care" carpet cleaner will take the stains out the least.

Conclusion: The "Formula 409" carpet cleaner took the stains out the best and the "Quality Care" carpet cleaner took the least amount of stains out. Procedure: 1.Cut the pieces of the carpet 2.Measure 1/2 cup of grape juice 3.Pour grape juice on cut carpet 4.Spray carpet cleaner onto stained carpet 5.Scrub stained carpet 6.Look at the results

**Project Number:** MCH069

**Grade:** 8

**Title:** The Floating Egg

**Abstract:** The purpose of this experiment is to see why an egg can float in water. This happens when salt is dissolved in warm water which makes the water denser and the egg will float. In the procedure an egg, warm water, pitcher, salt, a tape measure, and a spoon are needed. First put the warm water in the pitcher. Then put the egg in the water and watch it float to the bottom. Then start to add the salt, one tablespoon at a time. When the egg rises, record number of tablespoons that were needed to float the egg. The data shows that with 32oz. of warm water and five tablespoons of salt the egg rose.

**Project Number:** MCH071

**Grade:** 7

**Title:** Toothpaste vs. Freshness

**Abstract:** Purpose:The purpose of my project was to see which commonly used toothpaste would work the best. Conclusion:My conclusion for my project was Ultrabrite ended up being the toothpaste that kept my breath the freshest the longest. Procedure:Day 1:I used tothpaste #1. Observed how long my freshness stayed up I recorded the info.I performed twice again except using toothpaste 1&2.

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**Project Number:** MCM001

**Grade:** 8

**Title:** Prevention of Brute Force Attacks in Quantum Cryptography

**Abstract:** I wrote a program in Command Prompt using PERL to show that Brute Force Attacks can be prevented. I incorporated both Quantum Cryptography and Normal Cryptography. I also wrote an algorithm to generate the next keys (generate as many as needed). First Key - generated using Quantum Cryptography. Next keys - generate using my algorithm. (These keys are in normal cryptography).

**Project Number:** MCM002

**Grade:** 7

**Title:** Full Fuel?

**Abstract:** After building a simulated gas tank, I will connect it to the computer using a potentiometer, circuits, and Vernier and open the program, Logger Pro. Logger Pro will give me readings as the water drains at a constant rate. My results will help me to find the reason why the needle on a gas gauge stays on full, even when the fuel amount is below this.

**Project Number:** MCM003

**Grade:** 7

**Title:** Can AI Stack a Deck?

**Abstract:** My hypothesis was that I can produce a program that will cause a victory in Solitaire with the least possible work from the player using C++. After downloading a compiler and graphics library, I took pictures of playing cards, which I scanned. I then declared all 52 integer variables representing each of the possible slots a card could occupy on-screen. I then used the computer's clock to generate random numbers between one and four for each of these variables, making sure to use code that would prevent cards from appearing twice. Lastly I performed ten tests, which worked.

**Project Number:** MCM004

**Grade:** 7

**Title:** M&M's Colors Galore

**Abstract:** Sometimes statistics can be unpredictable, however, you can make predictions and use statistics to find outcomes. I did a statistical analysis to test the frequency of colors available per M & M bag. Using ten bags of M & M's. I sorted, counted, and graphed my results, per bag. I calculated all of the samples by gathering totals. My hypothesis was accurate. I found that the colors vary per bag, although the weight per bag is the same. In closing, it is apparent that in everyday life, even with small amounts of a given variable, the results may not be similar. Chocolates are like life!

**Project Number:** MCM005

**Grade:** 8

**Title:** Proportion for Perfection

**Abstract:** The purpose of this experiment is to determine if the golden ratio can be found in architectural proportion and if it is related to perceived beauty, if found. The procedure of this experiment is to first study pictures of architectural design and determine if the golden ratio can be found, and then see if the general perception of beauty is related to actual mathematical perfection. The experiment revealed that the golden ratio can be found in architectural proportion. However, the general perception of beauty is only in proportion with

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the golden ratio 16.36% of the time. In conclusion, the golden ratio can be found in architectural proportion and can be related to perceived beauty depending on the student's perception.

**Project Number:** MCM006

**Grade:** 7

**Title:** Scalability of Distributed Processing

**Abstract:** Cloud computing and distributed processing are highly publicized Internet technologies. The purpose of this experiment was to measure the efficiency of Hadoop, which is the leading open source distributed processing platform. The experiment was carried out by running a large and consistent workload several times, and increasing the number of nodes from one node to six nodes. My hypothesis was that it would scale linearly. But I found that it scaled in an exponential fall-off form, indicating that there are inefficiencies in Hadoop.

**Project Number:** MCM007

**Grade:** 8

**Title:** Trends in Energy Consumption

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

**Project Number:** MCM008

**Grade:** 8

**Title:** How likely is it for an organism to turn harmful?

**Abstract:** An organism such as bacterium might start as a useful or harmless being. However, over a period, due to varied causes, it might undergo changes in its genes known as mutations. At some point, the genome if the resulting changes could match the genome of a different organism which is very harmful to other organisms. What is the probability of its turning into a harmful bacterium? The goal of this project is to experiment with these changes using a simple computer program and to study the probability of harmless bacterium turning into a harmful one.

**Project Number:** MCM009

**Grade:** 8

**Title:** Can Field Dimensions Affect WP?

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

**Project Number:** MCM010

**Grade:** 7

**Title:** The Geometry of Soccer

**Abstract:** I am trying to find out which angle would be best to shoot a soccer ball into the net. I measured out all of the angles. I put a bucket in front of the goal to show the different angles. My results showed that the bigger the goal, the easier it was to score a goal. When the goal was smaller it made it harder to make it in. I took ten shots from each of the ten angles. My hypothesis said it would be possible to predict which angle is best for scoring the goal. I supported my hypothesis.

**Project Number:** MCM011

**Grade:** 8

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**Title:** A look as to how to play Craps to you best advantage

**Abstract:** I look at the disadvantages of craps. Then i calcluate them. Lastly I take what i know and then organize it into a table. Then i analyze the table and determine the best and worst bets for a person playing craps. After that i take loaded dice and account for it being loaded in my calculations and then choose the worst of the loaded dice bets and the best of the loaded dice bets.

**Project Number:** MCM012

**Grade:** 7

**Title:** Got Blackjack?

**Abstract:** Blackjack is not all chance. My experiment's purpose was determining whether Blackjack's conditional probability allows the game to be beaten. Using a one deck shoe, play 66 shoes utilizing guessing, basic strategy, and finally basic strategy with card counting. Record wins/ losses per hand, calculating money won/lost and win percentages. Card counting resulted in a 68% increase in money won. Counting did not alter number of wins. Results indicate conditional probability allows the card counter to place smarter bets based on cards previously played, increasing his winnings. Future research could include playing more shoes or multiple deck shoes.

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**Project Number:** MCS001

**Grade:** 7

**Title:** French Fry Temperatures

**Abstract:** The purpose of this experiment was to determine whether the shape of a French fry affects its cooling. For the procedures, the experimenter would cook one fry at a time, and then record its initial temperature, and so on for five minutes. They would do this for the curly fry, the crinkle fry, and the original fry, and repeat seven times for accurate results. The curly fry decreased 27 degrees, the crinkle fry decreased 32 degrees, and the original fry decreased 36 degrees. The conclusion was that the hypothesis was invalid and that surface area shows no effect on how fast an object cools.

**Project Number:** MCS002

**Grade:** 8

**Title:** Tummy Ache

**Abstract:** The problem I investigated was which brand of stomach pain relieving antacid medicine increased the pH levels of the stomach the most, took the longest to dissolve, and kept excessive acidity away the longest. I simulated a stomachache from excessive acidity. I used Pepto-Bismol, Tums, Roloids, and baking soda to test my theory. I inserted the pills into the simulated stomach and recorded the results. Roloids proved to be the best.

**Project Number:** MCS003

**Grade:** 7

**Title:** Why Antacids?

**Abstract:** I am testing different antacids to see which antacid works the quickest and the best. I tested four different juices to see the level of pH and alkalinity in each juice. After I tested the juices I placed one antacid tablet into the juices tested them again. Alka-Seltzer had the biggest change compared to the other antacids. Alka-Seltzer also worked the quickest and the best. I hypothesized that Tagamet hb200 would work the quickest and the best because it claimed to work better than Pepcid AC, but it didn't.

**Project Number:** MCS004

**Grade:** 8

**Title:** Stay Tuned

**Abstract:** My question is which type of guitar string would stay in tune the best using steel, bronze, and nylon. My hypothesis is that the steel guitar string would stay in tune the best. Three acoustic guitars were strung with different types of string. The types of strings used were steel, bronze, and nylon. Then, each guitar was tuned using a digital quartz tuner. After 30 minutes, the guitars were checked for proper tuning, and the results were recorded. Then, the procedure was repeated three times. In conclusion, it was found that the steel string stayed tuned the best. It was determined that the steel string did not expand as much as the bronze or nylon strings. Because of this, the steel strings remained in tune. It was also found that each string stayed tuned better with each trial as the strings stretched.

**Project Number:** MCS005

**Grade:** 8

**Title:** The Effect of Packing Material on Shock Waves

**Abstract:** My project was "The Effect of Packing Materials on Shock Waves." The results from my project showed that the air pad was the best. The styrofoam came in second, the packing peanuts came in third, bubble wrap came in fourth, and the paper pad came in fifth. The results from my project can help anyone who is moving, mailing a package, or just

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packing things for home storage. To do this project I used all five packing materials and dropped it 20 times with two shock wave activated sound balls. Next time I will use a variety of boxes.

**Project Number:** MCS006

**Grade:** 8

**Title:** Low Fat vs Regular Foods

**Abstract:** The purpose of this project was to see if people could tell the difference between low-fat and regular foods. The conclusion to be drawn from this experiment is if people can reduce their fat consumption with the same satisfaction, they can live a healthier lifestyle. In conclusion, some foods, such as Snack Pack Pudding and Club Crackers, could easily have the low-fat variation substituted for the regular item

**Project Number:** MCS007

**Grade:** 8

**Title:** Perfect Polish

**Abstract:** By doing this project, I hope to prove that cheaper brands of nail polish are just as good or better than salon and expensive brands of nail polish. My coverage test was measured using a densitometer because if a polish is denser it'll have a better coverage. And to test the quick dry test, every ten seconds I touched the polish on the fake nail with a toothpick. China Glaze did the best coverage wise; Maybelline did the best at the quickest to dry. Pure Ice did the worst in both tests. Nail Technicians and anyone who paints their nails themselves would benefit from both of these projects.

**Project Number:** MCS008

**Grade:** 8

**Title:** Battle of the Batteries

**Abstract:** At summer camps, batteries are one of the necessities if you are planning on using a flashlight. For a week-long camp, running out of batteries is a major problem. My experiment was done in order to see which popular brand of batteries lasted the longest. I tested Energizer, Rayovac, and Duracell batteries. By putting them in identical flashlights, and leaving these flashlights on until the batteries they contained died, I determined that Rayovac batteries lasted the longest. Rayovac was also the least expensive battery, so this makes them the most cost-effective brand.

**Project Number:** MCS009

**Grade:** 7

**Title:** Which Whitens Best?

**Abstract:** My purpose for my experiment is to test the whitening differences between of Crest whitening toothpaste, regular toothpaste, and Crest white strips. I am also going to test if it matters what type of toothbrush you use, electronic or manual. My hypothesis is that crest white strips will whiten better than crest toothpaste and that an electronic toothbrush will brush better and more consistently than a manual toothbrush. In conclusion, the results of my experiment is that crest whitening toothpaste and a manual toothbrush work the best.

**Project Number:** MCS010

**Grade:** 7

**Title:** Natural vs. Brand Name Cleaning Products.

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**Abstract:** Test the natural cleaners Borax and Baking Soda and Water and Vinegar to see effectiveness versus brand names Mr. Clean, Formula 409, Clorox Green Works, and Windex Antibacterial. Staphylococcus epidermidis and Escherichia coli will be the bacteria used. These bacteria will be streaked on an auger plate and four disks, which will be soaked in a cleaner, then placed on the plate. After the plates have been in an incubator for 72 hours, the zone of inhibition will be recorded. The averaged results will be compared to see if a natural or brand name cleaner is the most effective.

**Project Number:** MCS011

**Grade:** 7

**Title:** Bacteria Busters

**Abstract:** Salmonella sickens people each year. This experiment will determine which Anti-Bacterial wipe kills it. My procedures. I spread the chicken juice on the counter. Let it sit for 30 minutes. Cut each wipe into circles. Swab the chicken juice with a cotton swab. Wipe the swab on a agar plate. Put the wipe on the center of the agar. Measured the zone of inhibition. Lysol did the best.

**Project Number:** MCS012

**Grade:** 7

**Title:** Having Pains Over Stains? What Detergent Works Best?

**Abstract:** Have you ever gone out in public and realized that you have a small but noticeable ketchup stain on the front of your new white T-shirt? Can these pesky stains be removed? How can you know which detergent works best? Three detergents selected for this experiment, Tide, Oxi Clean and Seventh Generation. Six common stains were applied to 100% cotton white T-shirts, and each shirt was laundered in one of the three detergents being evaluated. Hot tap water was used as a control. Stain removal was evaluated using a scientist-generated rating scale, and results were tabulated.

**Project Number:** MCS013

**Grade:** 8

**Title:** The Effect of Antifreeze on the Environment

**Abstract:** I selected my topic to find out if antifreeze has an effect on the environment. I hope to prove that it does so I can help people with cars to choose the right antifreeze. What I did for my project was plant grass. I watered plants with water until they sprouted then I started adding antifreeze. When my experiment was finished, my results showed me that my control(water) was extremely higher than the antifreeze. The antifreeze Zerex did the best. In conclusion my project will help the environment by having more people using Zerex, the most environmentally friendly antifreeze.

**Project Number:** MCS014

**Grade:** 7

**Title:** Green Bags in Action

**Abstract:** The purpose of this investigation was to determine if Debbie Meyer Green Bags keep bananas from over ripening. Each banana was placed in a brown bag, sealed container, Debbie Meyer Green Bag, plastic storage bag, and a counter top. Each banana was observed daily and degree of ripeness was measured using a ripeness scale. The bananas placed in the Debbie Meyer Green Bags, plastic bags, and bananas left out on the counter top ripened the most. It is unnecessary for consumers to purchase these bags for their bananas

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**Project Number:** MCS015

**Grade:** 8

**Title:** Battery Life

**Abstract:** The title of my project is Battery Life. The purpose for doing this project is to determine various types of batteries longevity and which ones are the best to buy. The flashlights in our home never seem to have working batteries when you need them. The experiment involved placing two D batteries (Duracell, Everready, Energizer, and Dollar Store brand) into four flashlights, labeling each flashlight, turning the flashlights on, recording the time they were turned on and recording the time when they burnt out. The results confirmed my hypothesis that the most expensive battery would outlast the cheaper brands.

**Project Number:** MCS016

**Grade:** 7

**Title:** Which Paper Towel is More Durable

**Abstract:** The purpose of my experiment was to figure out which paper towel could withstand the most pennies when wet with water. The procedures I used were that I bought four rolls of paper towels. Then I tested all of them. Finally I found out which paper towel was more durable. Bounty held 369 pennies and Sparkle held 254 pennies. Then Brawney held 396 pennies and Viva held 296 pennies. In this experiment I found out that Brawney held the most pennies which weighed up to 0.9979 kilograms. Also that Sparkle held the least amount of pennies which weighed up to 0.7303 kilograms.

**Project Number:** MCS017

**Grade:** 7

**Title:** Artificial Sugar vs Regular Sugar

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

**Project Number:** MCS018

**Grade:** 7

**Title:** How effective are different packaging materials at protecting an egg?

**Abstract:** For my seventh grade science project and for Sci-Tech I have created this project to see how affective different packaging materials are at protecting an egg. First I wrapped four with cloth, four with scotch tape, four with bubble wrap, and four with rubber bands. Then I dropped them onto the floor. Then I carefully took the packaging materials off. Then I took pictures off the cracks. I discovered that the eggs wrapped with bubble wrap had the least amount of cracks and the eggs wrapped with rubber bands cracked the most. In conclusion bubble wrap protects an egg the best.

**Project Number:** MCS019

**Grade:** 8

**Title:** Electrolytes: Where Are They?

**Abstract:** The purpose of the experiment was to see which common household items contain the most electorlytes. Liquids such as soy sauce, lemon juice, and coffee were tested with an ohm meter for resistance. It was found that soy sauce contained the highest amount of electrolytes.

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**Project Number:** MCS021

**Grade:** 8

**Title:** Fat in French Fries

**Abstract:** I tested five brands of French fries to find their fat content. I measured 2.5 grams of McDonald's, Burger King, Wendy's, Arby's, and school French fries. I found that Arby's had the most fat, then Burger King, next Wendy's, after that McDonald's, and finally school brand french fries with the least fat. I am happy to have these facts because I would like to get healthier with my diet choices and picking the brand of French fries with the least fat is a great first step in that process. Next time I will use larger amounts of fries.

**Project Number:** MCS022

**Grade:** 7

**Title:** Iron in Cereal

**Abstract:** The title of my project is Iron in Cereal. I wanted to find which cereal has the most iron content. My hypothesis was that Lucky Charms would have more iron than Captain Crunch. To do my experiment, I poured equal amounts of Lucky Charms and Captain Crunch cereals into bowls then covered each with equal amounts of water. Allowing the bowls to sit until the cereal became soggy. Stirred the mixtures with a wooden spoon and then placed a magnet into the mixture. Scraped the iron from the magnet onto the coffee filter and then weighed the amounts. My conclusion was that Captain Crunch had more iron content than Lucky Charms and this proved my hypothesis incorrect.

**Project Number:** MCS024

**Grade:** 8

**Title:** Which Brand of Smokeless Tobacco Contains Most Impurities

**Abstract:** My project was to show what brand of smokeless tobacco had the most impurities. My brands were, Skoal, Copenhagen, Timber Wolf, Grizzly, and Red Man smokeless tobacco. I thought Copenhagen smokeless tobacco had the most impurities. I took one gram of tobacco and 8 mL of hydrochloric acid. I combined both in a test tube and put it in the centrifuge. I waited 10 minutes and took it out. I recorded my data. My hypothesis was wrong! Timber Wolf had the most impurities. If I were going to do this project again, I would find out what those impurities are.

**Project Number:** MCS025

**Grade:** 7

**Title:** Household Paint Eaters

**Abstract:** Household paints are made to withstand almost anything. This experiment is intended to see if the paint can hold up to tap water, lemon juice, and coca cola. Three pieces of wood were painted with Glidden semi gloss paint and for seven days tap water, lemon juice, and coca cola were applied to each. It was determined that tap water had no affect on the paint, lemon juice took the glossy layer off, and coca cola ate away the layers of the paint revealing the wood.

**Project Number:** MCS026

**Grade:** 8

**Title:** The Apple Wrap

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**Abstract:** Everyone loves to eat a juicy apple, but what do you wrap the leftovers in to keep them from browning? This project proved which type of covering would do this. Four different types of coverings held a slice of apple and were placed on a tray in my dining room. I monitored the apples and watched for browning. I used plastic wrap, wax paper, clear Ziploc bags, and clear Tupperware containers. In my project, the clear Tupperware container worked best.

**Project Number:** MCS027

**Grade:** 7

**Title:** Up In Flames

**Abstract:** With my project, I was trying to discover which of the listed fabrics burns the fastest, and which one burns the slowest. To do this I did an experiment. For my experiment, my mom and I got two frying pans, and got three samples of eight different fabrics, (each six inches by six inches) and burned them in the pans. Then we recorded everything we saw in tables. When we were through, I averaged all the times for each fabric and found that silk fabric burned the fastest and linen fabric burned the slowest. We also found that while cotton did not burn the fastest, it did burn a lot faster than wool. So my hypothesis was partially supported. Now that I've seen these fabrics burning, it's easier to understand the importance of the laws put in place on clothing to keep us safe.

**Project Number:** MCS028

**Grade:** 7

**Title:** Dish Soap

**Abstract:** The purpose of my experiment was to determine which dish soap cleaned the most dishes. My hypothesis was dish soap with Oxi-Plus would clean more dishes than regular dish soap. To test my hypothesis I dirtied dishes and then placed dish soap into a scrubber to see how many dishes the dish soap would clean. My results were that the dish soap with Oxi-Plus cleaned the most dishes.

**Project Number:** MCS029

**Grade:** 7

**Title:** Project: Snow Meltdown

**Abstract:** I did this experiment to see whether a snow melting product put on in liquid form before snow falls melts snow faster than if its put on in granular after snow falls. My materials were three storage containers, snow, salt, and water, which I used in two tests. (TEST1) the product used in granular form. (TEST2) the product used in liquid form. The results of TEST1 were that Road Runner and SWI tied for first and Morton came in last. The results for TEST2 were that Morton was first, SWI was second, and Road Runner came in last.

**Project Number:** MCS030

**Grade:** 7

**Title:** Methods of Cooking

**Abstract:** The purpose of my experiment was to see which method of cooking cooks potatoes faster: baking, boiling, or grilling. My hypothesis was that boiling would cook the fastest. The results of my experiments were as follows: baking was the fastest, then grilling, and finally boiling.

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**Project Number:** MCS031

**Grade:** 8

**Title:** The Effects of Laundry Baskets on the Human Spine

**Abstract:** I selected this topic because my back hurt when I had laundry to do. First I found the angle of the rod. Then I equaled out the weight. Finally I tested the laundry baskets. The best laundry basket is small and round. The second and third laundry baskets were the round, medium basket and the square medium basket. The fourth best laundry basket was the flat rectangular one and finally the tall round one. My results were not what I had expected. Next time I would have more accurate tools.

**Project Number:** MCS032

**Grade:** 7

**Title:** Are florescent bulbs brighter?

**Abstract:** The purpose of experiment was to test to see if compact florescent light bulbs were as bright as energy efficient bulbs. I set up all materials in a dark room. Turned off lights and turned on light meter and lamp then recorded the brightness of the bulb. I repeated these steps with all bulbs. In conclusion, many of the tests went the way I had predicted, but there were some that surprised me.

**Project Number:** MCS034

**Grade:** 7

**Title:** How effective is deck paint?

**Abstract:** The purpose of my experiment is to identify the most effective waterproof deck paint. Four blocks of pine painted wood, with the deck paints listed in my Research Plan, will be placed in separate trays. I will wait 48 hours before pouring a gallon of water into each tray. After 24 hours, I will measure the mass of each block. The wood with the largest mass was painted with the least effective deck paint. I will repeat the procedure two times and then average my results. Since I have not yet conducted this experiment, I do not have conclusive data.

**Project Number:** MCS035

**Grade:** 8

**Title:** Spot Solver

**Abstract:** Have you ever spilled a liquid on carpet? In order to begin testing it was necessary to cut 360 squares of carpet. First, measure and pour ten mL of liquid. Place a paper towel underneath the carpet for five minutes to determine to observe whether or not any product leaks through the carpet backing. The blotting process occurs by applying mass on the carpet. Spray stain remover on the carpet and allow it to rest for fifteen minutes before blotting again. When a liquid is spilt on carpet act smart like a "Spot Solver!"

**Project Number:** MCS036

**Grade:** 7

**Title:** Strength of Fishing Line

**Abstract:** The purpose was to determine which brand of 3.6kg fishing line holds the most weight without breaking from five brands chosen. Fishing line was hung from a pole, and a bucket was hung from the line. Sand was added to the bucket until the line broke. Each brand was tested seven times. The averages were as follows: The Sufix Elite held 3.64kg, Stren Super Knot held 3.58kg, Trilene XT Extra Tough held 4.09kg, Triple Fish Fluorocarbon

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held 1.70kg, and Fireline Crystal held 5.36kg. The Fireline Crystal held the most weight. This experiment will help fishermen decide which brand to buy.

**Project Number:** MCS037

**Grade:** 8

**Title:** Corrosive of Soft Drinks

**Abstract:** I am doing my project on the corrosiveness of soda. I am doing this because I am curious about what happens to your teeth and your body when you drink a lot of soda. I am going to test it by putting a piece of salami in 4 cups of different types of soda, and let it sit for a week. I will measure the diameter of salami before I put it in the cups. Then I will measure it again after the week is over. This experiment can inform me about what soda can do to your body.

**Project Number:** MCS038

**Grade:** 7

**Title:** Digital Pen vs Penmanship

**Abstract:** Digital Pen and paper handwritten translation has improved significantly in 10 years. However, how reliable is it over a large sampling of users and writing styles? Using the Logitech Software Search function, handwritten samples were compared. Ten common english language terms were printed onto digital paper and traced with a digital pen. Using the same pen, 20 adults wrote each word twice, using manuscript and cursive. Comparing the neatest writing to the worst, the spacing between the letters was the difference. The printed writing scored higher search relevancy than the cursive. Overall translation accuracy produced for my experiment was 89%.

**Project Number:** MCS039

**Grade:** 8

**Title:** Meltdown in Minutes

**Abstract:** In my experiment, I tested three different types of salt to see which one would melt ice the fastest. I used Calcium Chloride, Rock Salt, and Table Salt. I used three cups of completely frozen water and put five mL of each salt in each one. I then observed each type of salt every ten minutes to see which one started to melt the ice the fastest. My hypothesis was incorrect. I thought that Rock Salt would melt the ice the fastest but Calcium Chloride did. This was followed by Rock Salt and then Table Salt.

**Project Number:** MCS040

**Grade:** 8

**Title:** Which Bat is the Best?

**Abstract:** I selected this topic because I love softball and knew this would be a fun project. During this experiment I hoped to prove that some bats are better than others and not all the same. To do my testing, I set up the stand at home plate and set the pitching machine to 45kph. Then I pitched the ball at each bat twenty-five times. After each ball was hit I measured and recorded my results. The double walled had an average of 52.27m, end loaded had 51.5m, composite had 50.2m, aluminum had 49.8m and last, wooden had 48.7m.

**Project Number:** MCS041

**Grade:** 8

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**Title:** Paper Towel Strength

**Abstract:** This project was to find which paper towel brand was the strongest. Materials used were, water, 4 different paper towel brands, a syringe, and marbles. First soak a paper towel in 40 ml. of water. Then two people held the wet paper towel in each corner. Place marbles one-by-one on the paper towel until it brakes. Repeat the project steps twice to make sure the project is accurate. Bounty held the most marbles with an average of 113 and 1/3 marbles.

**Project Number:** MCS042

**Grade:** 7

**Title:** Stain Reducer

**Abstract:** I've observed different commercials for different detergents saying they reduce the stain and make the item brighter. Does each brand remove the stain? The purpose of this investigation is to determine which brand reduces or removes the stain. I obtained all materials and then cut pieces of T-shirts, 9cm by 9cm, then poured cranberry sauce on th items. I let them sit, then washed and air dried. Once done I used the palette to see th rating, then repeated for two more detergents, and recorded data. Tide won by reducing all of the stain and the hypothesis was supported.

**Project Number:** MCS043

**Grade:** 7

**Title:** Which Acne Medication Works Best?

**Abstract:** The purpose of this investigation is to determine which acne medication will work the best. 12 agar plates were coated with bacteria DH5A. 3 plates were set aside and labeled control 1, 2, and 3. The rest of the plates were divided into 4 quadrants. Sterile disks dipped in sterile water, Clearasil sulfur resorcinol were placed in each quadrant on all plates. The plates were covered and incubated at 37 degrees C for 72 hours. The plates were removed and the zones of inhibition for each disk were observed and recorded. Neutrogena 2.5% benzoyl peroxide formula had the highest average zone of inhibition, followed by clearasil sulfur resorciol, then Clearasil 10% benzoyl peroxide and finally water.

**Project Number:** MCS044

**Grade:** 8

**Title:** Smashed To Bits

**Abstract:** The purpose of the experiment was to test the quality and safety of glasses and goggles against the force of air soft projectiles. Air soft pellets were tested at a distance of ten feet against various glasses and goggles. Only specialized protective air soft goggles remained intact. All other glasses/goggles were cracked or broken.

**Project Number:** MCS045

**Grade:** 8

**Title:** Which Is the Best Hand Sanitizer?

**Abstract:** Hand sanitizers are the #1 killer of hand bacteria. This project was chosen to see which one would be the most effective at inhibiting bacterial growth the most. Petri dishes were streaked with cultures of *M. luteus* or *S. epidermidis*. Then, I placed paper discs saturated with 8 different hand sanitizers or water into the dishes, and incubated the plates for 48 hours at 37 degree Celsius. There were two trials for each hand sanitizer on each of the two bacteria cultures (36 tests). Then found and recorded the zones of inhibition. It was shown Lysol Healthy Touch was most effective.

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**Project Number:** MCS046

**Grade:** 8

**Title:** Which toothpaste cleans teeth best?

**Abstract:** For my school science fair and for Sci-Tech, I experimented to see which type of toothpaste would result in the whitest molars. The teeth were submersed in coke or lemon juice for 24 hours, then brushed with different types of toothpaste or just water for 28 days and analyzed each day, in which it was determined that Colgate and baking soda resulted in the whitest teeth. However, I discovered that any toothpaste works much better than no toothpaste.

**Project Number:** MCS047

**Grade:** 8

**Title:** Do Green Bags Slow Fruit Ripening?

**Abstract:** The purpose of this experiment was to test if Green Bags slow the ripening of fruit. The procedure was to keep one apple, pear, and banana in either Green Bag, plastic bag, paper bag, or an open bowl at room temperature and test fruits after 3, 6, 9, and 12 days. Apples and pears were stain with an iodine solution to detect remaining starch. Green Bags did not slow the ripening of apples and pears, and fruits in these bags were also the most spoiled and even rotten inside. Open bowls were the best storage overall.

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**Project Number:** MES001

**Grade:** 8

**Title:** How Ice Melts

**Abstract:** The purpose of this experiment is to determine the effect of the shape of ice on how quickly ice melts. Ice melting times were determined by measuring 500 ml. of water into five different shaped containers. The water was frozen. The ice was taken out of the containers and the total surface area of each sample was measured and recorded. In addition, the exposed area of each sample was determined. The ice samples were then put into separate melting trays. The start time was recorded. The time that each container's ice sample melted to total liquid was recorded. The data show that the shape of ice does affect the ice's melting time. The more surface area the piece of ice has, the faster it will melt. Sample 4 had the fastest melt time, as well as the largest surface area. It also had the largest exposed surface area. These findings can be used in the study of global warming and polar melting. Using similar data can be used to estimate the melting rate of ice bergs and the polar caps. This is important, because many living things depend on ice in the Polar Regions for their habitats.

**Project Number:** MES002

**Grade:** 8

**Title:** Galileo Telescope

**Abstract:** The purpose of the experiment was to see if it was possible to create a working model of a Galilean telescope. Different lens were used to replicate Galileo's first telescope. The final product was used to observe celestial bodies, such as the moon, at 20 x magnification.

**Project Number:** MES003

**Grade:** 8

**Title:** Mmmm, Salty!

**Abstract:** Salts affect our lives daily. The purpose of this experiment was to investigate what types of salt water solution would least affect sprout survival. Four groups of 36 sprouts were watered daily with 5ml of different type salt solution and one additional group with plain water. Significant loss of sprouts was noted in the iodized sea salt group. Epsom salt group was least affected.

**Project Number:** MES004

**Grade:** 8

**Title:** Acid Mine Drainage Effects

**Abstract:** The purpose of this project was to fully explore the damage of acid mine drainage on living organisms in a local stream. The procedures included finding the pH, iron level, and temperature of the four different testing sites in the stream. Four leaf packs were placed in the stream for three weeks and then removed. The data collected included types of leaves, pollution levels, and numbers and types of micro-invertebrates, macro-invertebrates, and microorganisms in each leaf pack. The pollution resulting from acid mine drainage does affect the number and types of organisms present in the local stream.

**Project Number:** MES005

**Grade:** 8

**Title:** Rising Radishes

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

**Project Number:** MES006

**Grade:** 8

**Title:** The Heat Is On

**Abstract:** This experiment investigates: "Do man made soil additives affect the absorption of light based heat energy?" Pesticides, herbicides, and fertilizer were tested in a cubic foot of topsoil to determine if any of these additives individually or cumulatively affected the amount of light heat the soil would absorb and retain in an 8 hour period in 1 hour temperature reading intervals taken at increasing depths in 1" increments. The average temperature increase of topsoil, fertilizer, herbicide, and pesticide cumulatively were 22.59, 23.08, 32.27 and 37.25 respectively. In conclusion, additives in soil increase the amount of heat the soli retains.

**Project Number:** MES007

**Grade:** 8

**Title:** Does Solar Energy Increase the Life of a Battery

**Abstract:** My purpose for doing this project was to see if solar energy could make battery life last longer. I selected this project to cut down on so many batteries in our landfills adding to global warming. I placed the battery on the charger. I tested five solar panels separately hooked up to a battery that attached to a motor. I timed how long the motor lasted. Next time I would test in the spring and summer.

**Project Number:** MES008

**Grade:** 8

**Title:** The Power of Produce

**Abstract:** My project purpose is to find which produces the most volts: a red delicious apple, a granny smith apple, a lemon, a banana, a potato, or a yam. I used a copper wire and a galvanized nail as the electrodes and, inserted them into each of the fruits and vegetables I teseted. Then I measured the volts produced by each of the items I tested with a voltmeter. I analyzed all of the data and concluded that the red delicious apple conducted the most volts, followed by the granny smith apple, the lemon, the potato, the yam, and the banana.

**Project Number:** MES009

**Grade:** 8

**Title:** Algae Bloom

**Abstract:** How does the ingredients nitrate and phosphate combined, separate, or none at all cause hair algae to produce? That was my problem in my experiment. The reason for my thinking would be the simple fact that nitrate and phosphate together are present in growing stimulants like fertilizers. Certain plants like the algae absorb these minerals and develop. Then I vigilantly tested the experiment with my procedure. My procedure included filling 10 small jars with the same amount of algae. I added to three cups the same amount of nitrate and phosphate combined. In the other three cups, I added the same amount of nitrate to the cups. In the next three cups, I just added the same amount of phosphate. In order to have a control, I added nothing to the last jar. I filled all ten cups with 240mL of room temperature water. I covered them lightly with tinfoil and set them under light for 20 days. Then, I recorded my data and observed the results.

**Project Number:** MES010

**Grade:** 7

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**Title:** Weather Instruments VS. Weather Folklore

**Abstract:** My question is: what is the better weather predictor, weather instruments or general folklore? My hypothesis is: I predict that the weather instruments will be a better predictor. The procedures are: I will put my journal into 14 categories. I will take the info from my instruments and folklore. I will finally compare it to my control.

**Project Number:** MES011

**Grade:** 8

**Title:** Which Erosion Control Method Works Best?

**Abstract:** The purpose of the investigator's project was to see which erosion control method works best. The investigator tested soil in planter boxes with soil alone, soil and mulch and soil and ground cover. The planter boxes were leaned against a wall to simulate a slope and after adding water to each box, it was concluded that the ground cover plants helped to prevent the most erosion.

**Project Number:** MES012

**Grade:** 8

**Title:** What Solar Energy Can Really Do!

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

**Project Number:** MES013

**Grade:** 7

**Title:** Which type of salt forms the most durable crystals?

**Abstract:** The purpose of this project is to make crystals out of different salts and classify them from the biggest and most durable to the smallest and weakest. I put five different salts into five glass jars. The salts are Epsom salt, iodized salt, coarse kosher salt, rock salt, and sea salt. Then I let the jars of salt water evaporate. Though they are still evaporating, I think the rock salt will be the biggest and the most durable because of its massive grains. I also think that the sea salt will have the smallest and the weakest crystal because of its small grains.

**Project Number:** MES014

**Grade:** 8

**Title:** An Xtra Atom Makes a Difference

**Abstract:** My purpose was to see whether the population affects ozone levels. I used test strips with potassium iodide and starch and placed them in different locations with differing populations. The tests took one and eight hours and then the color of the strips was compared to the Schonbein scale. My hypothesis was if the population in an area is high, then the ozone levels will be higher in that area than an area with lower population. One area had results that didn't match other test areas. My hypothesis was not supported which could be because wind can carry ozone many miles.

**Project Number:** MES015

**Grade:** 7

**Title:** Insulating Against the Wind Chill Factor

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**Abstract:** The wind chill factor is a phenomenon that makes a person feel colder on windy, winter days. The purpose is to test which fabric insulates best against the wind chill factor. The materials used include fleece, denim, wool, silk, linen, rayon, and nylon. The fabrics were tightly wrapped around seven glasses. The eighth glass is the control. Boiling water is poured into each glass and two fans were turned on. The water temperature was recorded every 5 minutes for 60 minutes. This experiment was repeated two more times and the readings were averaged. The results determined which fabric insulated best.

**Project Number:** MES016

**Grade:** 8

**Title:** Grass Is Always Greener

**Abstract:** I found runoff to be a major problem with today's farms and society, so I created a science fair project to see if ground cover can reduce runoff. I hypothesized that grass will reduce runoff more than dirt alone. I used six containers and filled three with dirt and in the other three containers I grew grass. For five seconds in each trial I used a watering can with a sprinkler head to pour water over the containers. After each trial I concluded grass in each trial reduced more runoff than dirt alone.

**Project Number:** MES017

**Grade:** 8

**Title:** Acid Rain and Seed Germination

**Abstract:** The purpose of this experiment is to see if acid kills plants. My hypothesis states that acid will kill lettuce seeds. I put lettuce seeds in petri dishes and added a concentration of lemon juice and water. The plants with more concentration of lemon juice killed more seeds. This shows that acid does kill plants.

**Project Number:** MES018

**Grade:** 7

**Title:** Air Quality In Allegheny County and Ingomar Middle School

**Abstract:** These studies were conducted to determine what the air quality in Allegheny County, PA and at Ingomar Middle School (Pittsburgh, PA) were like during winter. The Allegheny County Department of Health provided air quality data from December 19, 2008 to January 22, 2009 for 11 monitoring stations. The data for Ingomar Middle School was collected with air monitoring equipment from Group Against Smog & Pollution and mounted in one of the 7th grade classrooms. Air quality data included carbon monoxide, carbon dioxide, particulates, sulfur dioxide, ozone, and nitrogen dioxide. The air quality data for Allegheny County was below the standards for carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, and PM 10, 2.5. The data from Ingomar Middle School indicates that with the exception of the somewhat high carbon dioxide levels, that Ingomar Middle School is a healthy place to go to school.

**Project Number:** MES019

**Grade:** 7

**Title:** Exploring Solar Oven Cooking

**Abstract:** The purpose of this experiment is to explore the use and efficiency of a simple solar oven, by studying the effects of varying outside temperatures. A basic solar oven was constructed from an insulated, double cardboard box, with aluminum foil reflector panels. The oven was sealed using a Plexiglas door and electrical tape. An oven temperature gauge was placed inside. Over a series of days, beginning with various outside temperatures, maximum

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average oven temperatures were recorded. It was found that maximum average oven temperature was not directly related to beginning outside temperature.

**Project Number:** MES020

**Grade:** 7

**Title:** Volcanoes

**Abstract:** How fast does lava go down the sides of the volcano? Does the temperature of the water or vinegar affect the flow? To find the answers to these questions, I build two volcanoes. I constructed both bottles using two 16 ounce plastic bottles as the base. I then mixed six cups of flour, two cups of salt 4 tablespoons of cooking oil, and water. I built the volcano around each of the bottles using the dough. The first bottle I filled with 1 and ½ cups of warm tap water, six drops of food coloring, six drops of dish detergent, and two tablespoons of baking soda. I then slowly poured vinegar into the bottle. The second bottle I filled with the exact same ingredients, except in this bottle I used cold tap water. The bottle with the cold tap water flowed slightly faster than the bottle with the warm tap water. Finally, I emptied one of the bottles and tried the same experiment, but this time I did not use any water. The results of this experiment were slightly different than the one with the water. The only difference was that the “lava” was foamier. The “lava” did not flow as fast as it did when I used the water.

**Project Number:** MES021

**Grade:** 7

**Title:** Watt the Volt

**Abstract:** Concerns about the environment has encouraged scientists to develop alternative sources of energy. The purpose for doing this project was to make a battery using inexpensive materials which would help to clean the environment. My hypothesis was incorrect. I thought my experiment would produce six volts with no problem at all. An aluminum air battery is made from aluminum, paper towel, saltwater, and aquarium-filter charcoal. The battery is tested on a six volt flashlight bulb. The tests with the least amount of salt produced the most amount of electricity. The tests with the most amount of salt produced the least amount of electricity. I thought it would have a different outcome than it did.

**Project Number:** MES022

**Grade:** 8

**Title:** Tensile Strength of Common Woods

**Abstract:** Wood is a natural resource that is used in our everyday lives. As a natural resource, it should be used wisely. The type of wood used will depend on both the strength and the application needed for the wood. This project is being done to measure specific tensile strength of various woods. Even though tensile strength can show you the weakest type of wood, my intitial feeling is that soft wood will ave a lower tensile strength, this doesnt mean that it has no value as a natural resource.

**Project Number:** MES023

**Grade:** 8

**Title:** Which Water Freezes The Fastest

**Abstract:** The purpose of my experiment was to see which water freezes the fastest. I tested water, sugar ater, and salt water. I tested them each three times. I put 200 ml of water in each cup and filled the ones with salt and sugar with 2 teaspoons of salt and sugar. I analyzed my data and concluded in all three test water froze the fastest, with sugar water coming second all three times, which means salt water came in last all three times.

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**Project Number:** MES024

**Grade:** 7

**Title:** Phosphates' Effect On Algae

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

**Project Number:** MES025

**Grade:** 7

**Title:** Day of Pompeii

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

**Project Number:** MES026

**Grade:** 8

**Title:** Can Silicon Affect Plant Growth?

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

**Project Number:** MES027

**Grade:** 8

**Title:** Natural Weather Signals

**Abstract:** The purpose of this experiment was to see if the weather can be accurately predicted using natural weather signals. Weather data was collected daily for several months including such things as temperature, precipitation, and the "red sky at night" folklore. These results were compared to The Weather Channel forecast to determine the accuracy of the predictions based on natural weather signals. In conclusion, the weather data that was collected and the predictions made were fairly close to the actual daily weather.

**Project Number:** MES028

**Grade:** 8

**Title:** Energy of the Future

**Abstract:** The title of my project is Energy of the Future. My question is at which angle will a blade produce the most energy. I tested the blades at 25 degrees, 45 degrees, and 65 degrees. My hypothesis is the blade angled at 65 degrees will produce the most energy. First assemble the PVC windmill. Second, attach the nacelle to the windmill and wire to the volt meter. Then, turn on fan. Last, record data. It was concluded that in all my trials, the blade angled at 25 degrees produced the most energy and the blade at 65 degrees produced the least.

**Project Number:** MES029

**Grade:** 8

**Title:** Windmill Blade Design: Which is Best?

**Abstract:** The purpose of my project was to find out which windmill blade length and design was the most efficient. I built my windmill base out of legos and the blades out of balsa wood. Then I will use a rotational counter to time how long it takes for the blades to reach 200 rotations. I will analyze my data using a graph.

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**Project Number:** MES030

**Grade:** 8

**Title:** What Makes Ice Melt Faster?

**Abstract:** Snow in the winter makes the ice slippery and dangerous. Companies use salt to melt the ice and keep the streets safe. They use sand to give the roads traction. This experiment is to see what affect other materials will have on ice. I use salt, sugar, pepper and sand to experiment.

**Project Number:** MES031

**Grade:** 7

**Title:** Lead in Local Soils

**Abstract:** The purpose of this investigation was to determine whether soil collected from various locations is contaminated with lead. the procedures included: obtain all materials needed, collect soil samples from five different locations, mix soil samples with vinegar, test soil with indicator solution and compare the soil solution with color code chart on lead test kit. The data for the five locations ranges from 0 parts per million to 50 parts per million of lead. the hypothesis: if soil is collected from 5 different locations then the soil collected by the mill will have the most lead was proven correct.

**Project Number:** MES032

**Grade:** 8

**Title:** Gaseous Vegetables

**Abstract:** The purpose of the experiment was to see if it was possible to create usable gas energy from dehydrated split green peas and beans. The procedure involved soaking beans in water and then measuring the gas released in sealed bags. The experiment demonstrated the possibility of another alternative energy source.

**Project Number:** MES033

**Grade:** 8

**Title:** Capture The Current

**Abstract:** The purpose of Capture the Current was to recapture energy from a household, convert it into electricity, and determine which form of energy produced the most electricity. The materials I used were a solar panel kit, a wind turbine kit, a dynamo kit, and a multimeter. I connected the solar panel, the wind turbine, and the dynamo to a multimeter and a NiCd rechargeable battery to measure the current each system produced and its battery life. After completing the experiment, I found that motion energy produces the most amount of electricity, and solar energy produces the least amount of electricity.

**Project Number:** MES034

**Grade:** 8

**Title:** It's not easy being green

**Abstract:** Making the decision to live "Green" has been in the forefront of many people's minds lately. Supermarkets are full of products claiming to be "green" or nontoxic. Oftentimes these products are much more expensive than a product that does not claim to the same fame. Many people that are struggling to make ends meet in these financially tight times think twice before buying the more expensive "green products". Because of this decision, an experiment was conducted to determine whether spending the extra money on the green

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product is actually worth it. Did it really live up to its claims about being safe for the environment . Did the cleaning agent actually remove stains and get the clothes clean without harming the environment. the experiment was conducted by growing plants normally. These plants were watered with plain water until a healthy plant was established. Then they were split into 3 groups. The control watered with plain water ,one group the green group was watered with a 10:1 ratio of water to detergent and the regular group watered with a 10:1 ratio of water to regular detergent . the results established that the green detergent still had a negative effect on the plants. This decision was made by comparing the green plants to the regular plants and then both of these groups were compared to the control plants. All plants were dead except for the control plants which were healthy and thriving.

**Project Number:** MES035

**Grade:** 8

**Title:** Do Warmer Seas Make Stronger Hurricanes?

**Abstract:** The purpose of this experiment is to determine that water and air temperature affect on hurricanes strength. Hurricane data from the years 2003 through the year 2007 were collected including wind speed, air pressure, temperature, and the category of the storm. The data showed that hurricanes with the higher category were exposed to higher water and air temperatures. In conclusion, temperature did have an affect on the strength of a hurricane.

**Project Number:** MES036

**Grade:** 8

**Title:** Air Pollution

**Abstract:** The purpose for the experiment was to test and see the different amounts of air pollution in Northern Garrett County, Maryland. Five slides were placed in different areas in Northern Garrett County. Each slide had petroleum jelly spread on it to collect pollution particles during a week long period. Slide one was placed in a community with about 20 people living in the area, slide two was placed along route 219, the main thoroughfare, slide three was placed in Bitinger, Maryland(a small town), slide four was placed in a field and slide five was placed inside a small closed box. To be able to tell the changes during the week the slide were weighed before and after. Each slide started at 5 grams. At the end of the experiment, slide one weighed 9 grams, slide two 7 grams, slide three 5 grams, slide four 8 grams and slide five 5 grams. Slide one, two and four all increased in their weight due to pollution particles. Slide one placed in a human surrounded environment proved to be the most changing. This is due to humans and the way they live. For example a car, smoke stacks on houses, cigarette smoke and many more.

**Project Number:** MES037

**Grade:** 7

**Title:** Impact of Soil Amendments on Landfill Trash Degradation

**Abstract:** The purpose of this study is to evaluate the impact that various solutions have on the rate of landfilled trash degradation. Identical paper cups were designated as trash and were buried in soil at a constant depth. Prior to burial, the mass of the "trash" was measured. Each item of trash was surrounded by a PVC tube ("Trash burial unit") as it was buried in ground to control amendment delivery onto trash. Items were then subjected to solutions of selected soil amendments (e.g., nitrogen fertilizer, lime, etc). Soil amendments were applied regularly over a two month period. At the end of the test period, trash was excavated and evaluated for degradation.

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**Project Number:** MES038

**Grade:** 8

**Title:** Beware of "Fresh" Air

**Abstract:** I put together an experiment to figure out if air fresheners affected the growth household plants. I sprayed my air freshener groups with air fresheners every day; my control group was not sprayed. The plants were under growth lamps and watered with 15-20 milliliters of water. Then I would record my data every day. I recorded the height, number of leaves, healthiness, and any additional descriptions. I organized all my data into charts and came to a conclusion.

**Project Number:** MES039

**Grade:** 8

**Title:** Oil Spills

**Abstract:** The purpose for doing this experiment was to determine the effects of a simulated oil spill in an aquatic environment. My question was, what are the effects of a simulated oil spill? In my hypothesis, I stated that the fishbowl with the most amount of oil will have the greatest change in appearance. My procedure was simple. Five fishbowls filled with water and gravel were set up. Plants were added in for a week. A different amount of kerosene oil was added. The structure of the plants were observed. During my experiment, I found that the fishbowl with the most oil created the most damage. My hypothesis was proven correct.

**Project Number:** MES040

**Grade:** 7

**Title:** Dusting Floors

**Abstract:** In my experiment, I tested which type of floor would collect the most dust. I did this because I have very bad dust allergies. To start my experiment, I sprayed half of each of the floor samples with dust-preventing spray. After two weeks, I checked each of the flooring samples. I saw that there was little difference in the amount of dust each flooring sample collected. Therefore, with this data I figures that no type of flooring has more effect on the amount of dust in your house.

**Project Number:** MES041

**Grade:** 7

**Title:** Who Are The Best Recyclers?

**Abstract:** My purpose is to encourage the age groups who are not the best recyclers to be better. Also, to inform them of it's benefits. The procedure is finding 12 participants in different age groups. Then finding the percentage of recycled items related to the weight of both the recycling and garbage for three weeks. Age group 43-53 average was best, 37.95%. 65-over's average was 29.40%, and age group 54-64's average was 28.58%. 23.98% was age group 32-42's average. I learned the importance of recycling. Not many people do it well. Not recycling hurts our environment and will have future consequences.

**Project Number:** MES042

**Grade:** 7

**Title:** Pollutant Concentrations on Daphnia

**Abstract:** Daphnia are small crustaceans that live at the bottom of most streams, ponds, and rivers. In this experiment I tested different concentrations of pesticides, herbicides, and fertilizers on the Daphnia and observed the change in their heart rate. I made serial dilutions

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of the three types of pollutants to test different concentrations: 10%, 1%, .1%, .01%, and .001%. First I took the starting heart rate of the *D. magna*; then I tested each of the three pollutants in the five different concentrations on the *Daphnia* conducting 2 trials for each. I conducted this project because I read that water pollution affects our environment in many harmful ways. Since these chemicals runoff into the environment where these *Daphnia* live, and the food web begins with microorganisms, anything that affects them puts the entire food web in danger.

**Project Number:** MES043

**Grade:** 8

**Title:** Which Track Material Radiates the Least Heat?

**Abstract:** Scientists say that running and walking are the two most easy and efficient ways to exercise. The summertime is the time when people have the most time to get out and exercise. With summertime, though, comes the heat. What if we could replace the Asphalt and track material with a more natural substance that would radiate less heat? The hypothesis to be tested is that woodchips will provide a cooler track surface. Various surfaces were tested by directing a heat source at the surface, and measuring temperatures at 10, 30 and 60 minute intervals.

**Project Number:** MES044

**Grade:** 7

**Title:** What Water Left Behind

**Abstract:** The title of my science fair project is What Water Left Behind. I wanted to create a solar powered device, which would reveal the amount of salt in 0.35L of ocean water. Knowing the ocean was salty, I questioned how salty? My hypothesis was that the black painted pan would contain the most remaining salt. The procedure entailed painting pans, one red and one black. Position the elevated pans under a heat lamp, each containing 0.35L ocean water. A glass sheet was placed over the pans. The remains were recorded. Upon completion, the black pan contained the larger quantity because of the black pigments ability to absorb heat, rather than reflect. The residue remaining was larger in the black pan than the red pan.

**Project Number:** MES045

**Grade:** 7

**Title:** Solids, Liquids, and Gases

**Abstract:** I did this project to understand the three states of matter. I took six liquids and I observed the amount of time it took for each of them to transform into the three states of matter, solids, liquids, and gases. The molecules in a: Solid hold shape and have a fixed volume. Liquid take the shape of a container and also have a fixed volume. Gas Take the shape of their container and do not have a fixed volume. If I did this project again, I would use different liquids.

**Project Number:** MES046

**Grade:** 8

**Title:** Efficiency of Solar Panels

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

**Project Number:** MES047

**Grade:** 8

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**Title:** If We Build It, Will It Come?

**Abstract:** At heavy rainfalls water flows into the sewers, this ends with CSO and companies release water into the river. When buildings have green roofs they save water killing wildlife in rivers. Have three containers and add rocks. Each container has three levels of soil, and grass seeds. One container has one plant, then the next two... Water every three days, measure water not absorbed. My hypothesis was correct in saying that extensive worked the best. You can use the intensive depending on roof weight. People realize how much water is wasted. It could improve by expanding to a larger amount.

**Project Number:** MES049

**Grade:** 8

**Title:** A Crystal Clear Image

**Abstract:** The purpose of this experiment was to find out which temperature grew the best crystal gardens. The materials added to the sponges were: salt, ammonia, water and laundry bluing. The procedure was to put three sponges in a pie plate or cake pan, then add the mixture to the sponges. After a few days, observe the changes. The data shows that crystals grow better in warm temperatures, rather than cold temperatures. The reason for that is because when the garden was in the refrigerator it was so cold that the mixture froze. The chart showed the temperatures, growth, day and the tray. The cold tray had temperatures that ranged from 31° to 33° and did not have much growth for many of the days. While the warm tray had temperatures that ranged from 71° to 73° and had a lot of growth for many of the days.

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**Project Number:** MER001

**Grade:** 8

**Title:** Powering a lightbulb with an electric motor

**Abstract:** How does temperature affect solubility? In my project, I will be using hot, warm, and boiling water using a thermometer to measure the temperature. I will then use baking soda, table salt, and sugar to see how the temperature of water affects the solubility of a substance. I decided to use different types of substances that I knew could be dissolved in water. I predict that the hotter the water is, the easier the substance will dissolve and that all of the substances will dissolve the fastest in boiling water. I based this hypothesis on observation during my daily life.

**Project Number:** MER002

**Grade:** 8

**Title:** The New Era of Transportation

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

**Project Number:** MER003

**Grade:** 8

**Title:** Stable Skyscraper

**Abstract:** My project is on Stable Skyscrapers. I chose this experiment because I thought it would be interesting to find out if the depth of the building has any affect on the buildings stability during an earthquake. I made a model skyscraper out of legos. Then I am going to roll a ball and then measure the space between the soil and the skyscraper. I think the distance will tell me how far the skyscraper has shifted. I think it would be useful for people that build skyscrapers because it would tell them what depth the skyscraper would have to be to protect it against an earthquake.

**Project Number:** MER004

**Grade:** 8

**Title:** Blastoff

**Abstract:** I did this experiment to help figure out if the shape of the nosecone on a rocket affects how high it goes. From the results of this experiment I have found that the shape of a nosecone doesn't affect the height of the rocket. I selected four different shapes and a control to use in the test. All four nosecones were significantly different from each other, so I thought that if there was going to be any difference that these would show it even though the control did significantly better. Next time I would use smaller engines.

**Project Number:** MER005

**Grade:** 8

**Title:** Belopoiectis

**Abstract:** I am testing the effect of the lever material of a catapult on the distance an object will travel. I will be launching a catapult with a fiberglass, American mahogany, red oak, white oak, and pine lever twenty-five times for each material. I predicted that a fiberglass lever would make an object travel the farthest; and that the pine lever would make an object travel the least far. After all the testing was finished, I realized that my prediction was incorrect. Pine, which I predicted to work the worst, worked the best having an average launch of 9.008 meters.

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**Project Number:** MER006

**Grade:** 7

**Title:** How to Save Your Neck

**Abstract:** The purpose for this project was to design a safe and comfortable ice hockey neck guard. Basically the test procedure was place analog scale on flat hard surface, put block of EPS foam on the scale, put whatever material being tested at the time on top of that, and take skate blade and apply enough pressure so that the scale reads 14kg. The results showed that, the neck guard that was designed during this project is sufficient at reducing the depth of indentations made by ice hockey skates. The final throat design reduced indentations by 65%.

**Project Number:** MER007

**Grade:** 8

**Title:** Wind Power

**Abstract:** The main purpose of my experiment was to test which material would be the most efficient for the blades of a windmill. Due to today's issues with global warming I found wind power to be practical. In order to better understand wind turbines I decided to ask, "Which material would work best on the blades of a windmill?" I believed that the foam would work best, because it is more wind resistant

**Project Number:** MER008

**Grade:** 7

**Title:** Potato Clock

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

**Project Number:** MER009

**Grade:** 8

**Title:** Brace Structure

**Abstract:** The purpose of the experiment is to find the best structure to brace a square. I made 4 squares, exterior "X", interior corner, horizontal, and basic. The squares were made of wood and were 2x2. I then made a pulley out of wood (2x2). Nailed a hook at the end of each square, tied a rope to the end of the hook throw the pulley and on to a gallon of water. We then added weight until the structure broke. Recorded my results and made a data book. The interior corner brace was the best design holding over 20 lbs

**Project Number:** MER010

**Grade:** 8

**Title:** Solar Window Defrosters

**Abstract:** The Solar Powered Window Defroster was an invention created because of the difficulty people face in the winter due to the ice and snow that collects on vehicles. By collecting solar energy to power the defrosters, fuel is being saved since the vehicle does not need to be started to run defrosters. This also helps in reducing pollution caused by exhaust fumes. To complete this project, I had to research solar energy, design my model, and plan my visual presentation. The model worked well, yet it would have to be effective in generating the energy required for a full-size vehicle.

**Project Number:** MER011

**Grade:** 7

## INTERMEDIATE DIVISION – ENGINEERING/ROBOTICS

**Title:** Can LEDs make Any Color Light?

**Abstract:** My project is to see how I can mix red, green, and blue LED lights to make any color light. First, I have to set up my bread board and hook the wires and electrical components up. This includes my potentiometer because it lets me change the light intensity for each LED. Next, I put the LEDs in the bread board, and turn on the power supplies. Then I shine the mixed light on a piece of wax paper to enable me to see colored light. After this, I adjust the light intensity and see different colors from the LEDs.

**Project Number:** MER012

**Grade:** 7

**Title:** Robot's arm length vs throw

**Abstract:** My experiment is determining whether a robot's arm length will affect the distance it throws. I wanted to conduct this experiment to find out whether stability had a role in a robot's functions it carries out. For my procedure I constructed a robot using the Lego Mindstorm Kit. I then turned on the robot, and measured how far away the thrown object was from the robot. I would continue this with a shorter and longer arm, and then compare the results. I have not yet conducted my experiment so at this point I cannot come to conclusions or analyze data.

**Project Number:** MER013

**Grade:** 7

**Title:** Which Wood Absorbs Most Water?

**Abstract:** The purpose of this investigation is to determine which wood absorbs the most water. First the wood was cut to size, then massed and then soaked for 4 days then massed again. Oak absorbed an average of 15.56 grams, fir averaged 9.28 grams, and poplar averaged 4.97 grams. Oak wood absorbed the most and poplar the least.

**Project Number:** MER014

**Grade:** 8

**Title:** Wind Power

**Abstract:** I selected this topic because I wanted to find out which blade design on a wind turbine will produce the most electricity. I hope to prove that a wind turbine with a greater amount of blades and larger blades will produce the most electricity. To do this I took different combinations of blades made from PVC piping and put them on a wind turbine. I put the turbine outside in the wind and measured the electricity output by each of the blade combinations. In conclusion I found that the longer the blades you have, the fewer blades you should use.

**Project Number:** MER015

**Grade:** 8

**Title:** Power to the Car

**Abstract:** the problem I am trying to solve is, "Which source will allow the fuel cell car to go greater distances at greater speeds?" My hypothesis was that the sunlight would allow the fuel cell car to go a greater distance at a greater speed. I first measured 335.8 cm. I placed the car at the starting line. I placed the car under the sources. I measured how fast it took to get from start to finish. I recorded my results. I concluded that the fuel powered car ran faster when under sunlight, than under artificial light. My hypothesis was proven to be correct.

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**Project Number:** MER016

**Grade:** 7

**Title:** Does the Distance affect output RPM?

**Abstract:** With the rising price of petroleum, interest in cars with electric motors is increasing. Due to the shortfalls in current battery technology, the efficiency of the electric motor is critical to increasing the range ( miles before charge ). This experiment was conducted to discover whether the efficiency of the electric motor would increase by changing the distance between the magnets and the copper coils that comprise the motor. It was determined that as the distance between the magnets and the coils decreased, the efficiency of the motor increased. Likewise, as the distance increased, the efficiency of the motor decreased.

**Project Number:** MER017

**Grade:** 8

**Title:** Magnets and Motors

**Abstract:** The purpose of this project was to determine if stronger, rare-earth magnets that are more widely available and affordable can be used to create more powerful motor of the same size. I constructed a simple reed switch motor that uses permanent magnets on a rotor and fixed magnetic coil. I built three rotors. One rotor used common ceramic magnets while the other two used more powerful samarium-cobalt and neodymium magnets of the same size and compared the maximum torque each rotor. The results showed proved my hypothesis that the rotors using more powerful magnets produced more torque.

**Project Number:** MER018

**Grade:** 8

**Title:** To Lean or Not to Lean? What type of soil best supports structures?

**Abstract:** The base of any building structure should be solid to allow for a stable structure. There are several types of soil in which to build upon. The purpose of the science fair project was to determine the best type of soil for a building structure. Six main types of soil were tested: silty, chalky, loamy, peaty, sandy, and clay. The materials were gathered from different areas in Allegany and Garrett Counties. A tower of Lego blocks was built and set in each different type of soil. A fan was used to see how the wind would affect the soil base. Then water was added to each type of soil to determine the absorption rate of each type of soil. Additional water was added until the Lego block tower fell over. Each type of soil had a different rate of absorption. The sandy and peaty soils absorbed the water quickly, allowing the base to erode away quickly. The clay soil did not absorb the water quickly, therefore allowing for flooding around the base of the structure. The silty, chalky, and loamy soils allowed for the most amount of water before the structure fell. The water absorbed, but not too quickly. Therefore it did not erode the base away from the structure. It was determined from the experiment that the best type of soil for building structures was loamy soil. The wind had virtually no effect on the soil and the water absorbed at a good rate.

**Project Number:** MER019

**Grade:** 8

**Title:** Access Pedestrian Signal

**Abstract:** Access Pedestrian System (APS) controls traffic at intersections where pedestrians' activity centers. The innovative circuit and program design intends to enable a walk light after the main street green interval only if the walk light's request button has been

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activated. APS adds features to facilitate convenience; the walk light not only stays ON long enough for those handicapped but it also gives visual and audio warning for hearing and eyesight impaired pedestrians. The APS circuit is built using ATMEL\_ATTiny\_2313, LEDs, and various speakers and batteries. The code is written in a proprietary language and downloaded to microcontroller through infrared interface.

**Project Number:** MER020

**Grade:** 8

**Title:** Which Asphalt is Best?

**Abstract:** The purpose of this experiment was to determine which asphalt mix design can with stand diesel fuel. The procedure used for this experiment involved using asphalt core samples of each mix design. Each core sample was placed in 236.52 ml of diesel fuel for 14 days. The least porous core samples were then analyzed to see how much deterioration took place. The core sample showed little change, where as the the most porous core sample virtually crumbled into pieces.

**Project Number:** MER021

**Grade:** 8

**Title:** What Makes the Strongest Concrete?

**Abstract:** The title of my project is "What Makes the Strongest Concrete?" In this project, I tested different ratios of Portland cement makes the strongest concrete. After making mixes of 1 Portland cement, 2 Portland cement, 3 Portland cement, 4 Portland cement, and 5 Portland cement, I put the mixes into individual wooden forms. I put weights on the concrete slabs once they were dried. The mix with 5 Portland cement was the strongest.

**Project Number:** MER022

**Grade:** 8

**Title:** It's Hip to Be Square

**Abstract:** My project was to determine the effect of brace design on structure stability. I chose this because I am interested in engineering. I hoped to prove that bracing affects a structure's ability to maintain its shape. I constructed ten square wooden frames for each design. These were: X, inverted V, corner, horizontal, and no bracing. I applied horizontal force until each frame was pulled out of square. The X bracing maintained its shape best, followed by the inverted V, corner, horizontal, and no bracing. In conclusion, X bracing is the strongest because it distributes force equally in all directions.

**Project Number:** MER023

**Grade:** 8

**Title:** MagMotion

**Abstract:** The purpose of my experiment was to engineer a magnetic system that can be used to put objects in motion in a specific and controlled form to demonstrate that magnets can be used as a renewable energy source. To summarize the 3 systems that were created, System A was a simple motor which demonstrated that a battery and a magnet could cause a copper wire circle to spin. Systems B and C were hamster wheels that spun using magnetic force. In conclusion, magnetic force can be used as a renewable energy source, but need to further explore reliability and consistency.

**Project Number:** MER024

**Grade:** 7

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**Title:** Good Stability Makes a Good Rocket

**Abstract:** I will see how the center of gravity affects the stability of a rocket. What I will do is put a model rocket on a string to find the center of gravity and to see the stability of the model rocket. I hope to learn about the parts of the rocket and if the center of gravity affects the rocket during flight. I also plan to see if the CG changes during flight and how gravity plays a big part in making things fly! My hypothesis is that the rocket would be affected by the center of gravity because the CG determines if it stable.

**Project Number:** MER025

**Grade:** 8

**Title:** Wick the Wax

**Abstract:** My project is about testing a standard 1/8" wick to burn various sizes of candles. I will make a 3/4", 1", 1 1/2", 2", and a 4", inch candle, out of paraffin wax and see if a 1/8" wick will burn all of the wax. I think that the 1/8" wick will only burn the size 2" or smaller. I want to help consumers buy the most cost effective candle, while getting a good efficient longest lasting burn.!

**Project Number:** MER026

**Grade:** 7

**Title:** Which wall design is the best to use in windy locations?

**Abstract:** The purpose of my science project is to create three different types of walls and test them on their stability and strength. I will learn about architecture and how buildings stay up when there is severe weather. I will make my walls using the following materials: foam board and popsicle sticks. After I make the walls, I will test them by simulating harsh winds by using the different settings on a fan. I believe the wind will push all of the walls back, but the walls will move different amounts.

**Project Number:** MER027

**Grade:** 8

**Title:** Design to the Test

**Abstract:** The purpose of this experiment was to determine how much weight a platform with a different number of supports could hold. The procedure for this experiment included building 5 platforms, applying a variation of weights, recording data, and comparing the data to determine the conclusion. The data collected showed that if more supports are applied to the platforms, the more weight the platforms can hold. In researching physics, gravity was found to be the major factor in the experiment.

**Project Number:** MER028

**Grade:** 8

**Title:** Cracking up over concrete

**Abstract:** For my science fair project I tested reinforced concrete. I thought that perpendicularly crossing bars would support an 18in by 4in and by 2in deep. I tested it with 2 parallel bars and one with no bars as well as the perpendicular one. I used all the materials used to make concrete, a form and tools, as well as weights and recording information. Then I tested them and the perpendicular one held 57 ½ lbs, the one with parallel bars held 45lbs, and the one with no bars held 10 pounds. But the concrete may not have had enough time to dry.

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Project Number:** MMH001

**Grade:** 8

**Title:** Does weight affect the heart rate?

**Abstract:** My project is about if the weight of girls my age will weights affect the heart rate in different ways. I used 4 girls my age. I made them do 50 jumping jacks. Before they did jumping jacks, I took their pulse. Then they did their jumping jacks. Right after they did the jumping jacks, I took their pulse and then I subtracted the two pulse rates. My hypothesis was wrong because the girl whose weight was in the middle range was proved to be the highest pulse rate. If I did the same experiment with 4 different girls, then I think that I would get the same results.

**Project Number:** MMH002

**Grade:** 8

**Title:** Unexplored Factors Affecting Myopia and Hyperopia

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

**Project Number:** MMH003

**Grade:** 7

**Title:** Effects of Taxol On Chicken Embryonic Development

**Abstract:** The purpose of this experiment was to see the effects of Taxol on developing embryos. In the experiment, chicken eggs with embryos, at day 6, were taken. There were three variable groups (Taxol) and two control groups (DMSO). These chemicals were injected into the embryos. After two days, the embryos were observed and my hypothesis was rejected since the only problem with the embryo was death. DMSO was less toxic than Taxol. For future research; A more effective drug, such as Thalidomide, could have been studied and the embryos could have been used at an earlier stage of development.

**Project Number:** MMH004

**Grade:** 8

**Title:** The Use of Cinnamon Oil to Preserve Food

**Abstract:** Protecting food from spoiling has been a problem for thousands of years. According to recent scientific breakthroughs, cinnamon oil has been used to retard bacterial growth. So the question arises, does the concentration of cinnamon oil affect preservation? It is hypothesized that a 30% concentration of cinnamon oil will provide the best preservation. Unpreserved bread was treated with various concentrations of cinnamon oil to assess which concentration provided the best protection.

**Project Number:** MMH005

**Grade:** 8

**Title:** The Solubility of Vitamins

**Abstract:** Why are there warnings on the bottle of vitamins? Some vitamins are stored in the body and can build up to a toxic level. The purpose of this project is to determine the solubility of vitamins in water and fat. I hypothesized that vitamin E and A are fat-soluble while vitamin C is not. Each vitamin was put into test tubes of water, vegetable oil, and HCL and rated on their solubility. Vitamin E and A are mixed best with vegetable oil(fat-soluble), and vitamin C mixed best with water(water-soluble). You must be careful with vitamin E and A.

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Project Number:** MMH006

**Grade:** 7

**Title:** What Makes Your Heart Rate Increase the Most?

**Abstract:** The purpose of the investigator's project was to see which type of exercise caused the greatest increase in heart rate. Ten subjects were tested. Each subject was required to perform each of the following exercises for 4 minutes: bicycle riding, speed walking, and jogging. Overall, jogging caused an average increase in heart rate of 41 beats per minute above resting heart rate. This was a higher increase than bicycling and speed walking.

**Project Number:** MMH007

**Grade:** 7

**Title:** The Influence of a High Sodium Diet on Heart Rate

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

**Project Number:** MMH008

**Grade:** 8

**Title:** Which Acne Treatment is Most Effective?

**Abstract:** Acne is the term for plugged pores, blackheads or whiteheads, and deeper lumps known as cysts or nodules. All acne is a disorder of the pilosebaceous units, which exist mainly on the face, upper neck, and chest. People with acne spend well over a hundred million dollars a year on nonprescription acne treatments. I conducted this experiment to see which of the selected acne treatments would best stop the bacterial growth. Nine acne preparations and water were tested three times each for a total of thirty tests. The agar plates were streaked with *P. acnes*, and paper discs saturated with each acne preparation and water were placed on them. The plates were incubated for 48 hours at 37 degrees Celsius, and the zones of inhibition were measured and averaged. Overall, I found that the all-natural tea tree oil performed the best in inhibiting the bacterial growth.

**Project Number:** MMH009

**Grade:** 7

**Title:** OH My Aching Head

**Abstract:** My problem was to find which headache medicine dissolves the fastest. For my procedures, fill the beaker up with 125 ml of water. Heat the water on 4 setting and turn the spinner on. Wait until the water reached 37 C. Add 4.92 ml of bowl cleaner(hydrochloric acid).Put the headache medicine in the solution. Timed each to see which dissolved the fastest. Motrin dissolved fastest.

**Project Number:** MMH010

**Grade:** 8

**Title:** Bubbly Bacteria

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

**Project Number:** MMH011

**Grade:** 8

**Title:** Wipe Away

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Abstract:** A paper punch and forceps were sterilized. They were then created and stored in a sterile Petri dish. The quadrants were labeled for identification. A sterile nichrome loop was used to streak Staphylococcus Epidermidis. Sterile forceps were used to pick up the paper disk and place it in the disinfectant solution being tested. The disk was allowed to soak for 30 and allowed to drip for 30 seconds before being placed in a quadrant of the agar plate. The plate was taped shut, turned upside down and placed in an incubator set at 37 ° Celsius for 48 hours.

**Project Number:** MMH012

**Grade:** 8

**Title:** UV Light Effects On Plasmid DNA

**Abstract:** The motivation for this project is an interest in Genetic Engineering and researcher's attempts at utilizing bacteria to produce recombinant proteins such as insulin to try and treat diseases and create vaccines. To accomplish this, the effects of UV light on DNA structure and function using bacteria is tested.

**Project Number:** MMH013

**Grade:** 8

**Title:** Antibacterial Effects of Honey

**Abstract:** Effectiveness of five different types of honey to inhibit bacterial growth was tested on E.coli, Staphylococcus epidermidis, Bacillus subtilis, and Serratia marcescens bacterial strains. It was hypothesized that Manuka honey would inhibit the most bacterial growth due to its greater antibacterial properties. Agar plates were swabbed with each form of bacteria. Four holes were poked into the plates. A different honey was added to holes for each plate. The plates were incubated for 24 and 48 hours. Zones of inhibition were measured and averaged. Manuka honey had the largest zone of inhibition for all tested bacteria. The hypothesis was supported.

**Project Number:** MMH014

**Grade:** 8

**Title:** Pain, Pain Go Away

**Abstract:** I wanted to know which pill coating would dissolve the fastest. My hypothesis was the gel coating would dissolve fastest. I poured 25 ml of hydrochloric acid into a beaker, added 225 ml of water to reach a pH of 1, and turned on the magnetic stirrer. I set the stirrer to seven and the heat to 4, and watched the thermometer until it reached 37 C. I dropped the pill in, started the timer, and watched the pill until the coating wore away. Gel coating was fastest.

**Project Number:** MMH015

**Grade:** 8

**Title:** Taster or Non-Taster

**Abstract:** I'm doing this because I wanted to see if the ways you taste things are genetically inherited. I decide to test this project on my twin and I. I also tested it on my adopted mother and my adopted brother. We tasted this special taste paper that is normally unique to each person. My hypothesis is that I don't think that it's genetically inherited. I believe that using my twin sister for this project will help support my hypothesis. I personally believe that taste is not genetically inherited and the project helped me discover that more testing was needed.

**Project Number:** MMH016

**Grade:** 7

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Title:** Which liquid dissolves pills the fastest?

**Abstract:** My project was which liquid dissolves pills the fastest. I picked this experiment because I sometimes swallow pills, and I wondered how long it takes to dissolve in your body. I filled 3 beakers to 300ml of each of the 3 liquids, then dropped the aspirins in. Sprite dissolved the pills the fastest in every test, then came water, and then white grape juice. In conclusion I determined that my hypothesis was correct. I am planning on doing some more testing on pills.

**Project Number:** MMH017

**Grade:** 8

**Title:** Which Area of My School Holds the Most Bacteria?

**Abstract:** The purpose was to discover the amount of bacteria located in an area of my school. I selected this topic because I saw the amount of dirt accumulating and wanted to research on my topic further. I hoped to prove that my school is not the cleanest and should be cleaner. I swabbed the area I was testing and then the Petri dish. I then counted the colonies in the Petri dishes. Locker and toilet handles held the most bacteria. Keyboards were third. Desks, doorknobs, and paper towel dispensers had the least. Next I would test more areas.

**Project Number:** MMH018

**Grade:** 8

**Title:** Music and Blood Pressure

**Abstract:** The purpose of my experiment was to see if music had an effect on girl's blood pressure. I took five girls and took their blood pressure before and after they listened to music (classical, hip-hop, rock). My results so far are supporting my hypothesis. I will have more information for the science fair.

**Project Number:** MMH019

**Grade:** 7

**Title:** Lead in Your Life: Are You at Risk?

**Abstract:** There have been many product recalls due to the presence of lead. I wanted to see if there was lead in things that people use every day. I purchased a lead test kit as I did not have access to chemicals. I chose the kit that was rated the most accurate for home testing. I did two types of tests. One was a quick touch test and the other was a patented leach method. If the solution or swab changed colors, it was positive for lead. My experiment showed lead was present in some common household items.

**Project Number:** MMH020

**Grade:** 8

**Title:** Dirty Little Secret

**Abstract:** The purpose of my project is to see which common household surface is the most contaminated. I first marked off each area with tape and put on gloves. I swabbed the area and put it on an agar plate and let the bacteria grow. Each day I counted the colonies. I compared different surface areas. I recorded my results and observations. The toilet flusher handle had the most bacteria.

**Project Number:** MMH021

**Grade:** 7

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Title:** What Can Kill Bacteria the Best?

**Abstract:** The purpose of this science project was to see if ordinary household sanitizers have an effect on the growth of bacteria. Using four different cleaning solutions; hand sanitizer, plain soap, antibacterial soap and alcohol, this was accomplished. The solutions were placed on bacteria and observed to see which kill the most bacteria. Of the four solutions, hand sanitizer killed the most bacteria. The results support my hypothesis because hand sanitizer killed the most bacteria. A graph showing the difference between the solutions was made. To obtain better results I could have observed for a longer period of time.

**Project Number:** MMH022

**Grade:** 8

**Title:** What Hand Soap Inhibits Bacteria Best?

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

**Project Number:** MMH023

**Grade:** 8

**Title:** Natural vs. Synthetic Antibiotics

**Abstract:** Antibiotics are drugs that inhibit bacterial growth. Bacteria can become immune to synthetic antibiotics; therefore the purpose of this experiment was to see if natural antibiotics were more/as effective as synthetic antibiotics. Paper discs containing each of the 9 antibiotics or water were placed on agar plates of Staphylococcus epidermidis and Micrococcus luteus, for a total of 60 tests. The plates were incubated and the zones of inhibition were measured. This investigation showed that synthetic antibiotics were more effective. Tea tree oil was the most effective natural antibiotic. Further research in this field would include testing more synthetic antibiotics.

**Project Number:** MMH024

**Grade:** 7

**Title:** A Study of Antibacterial Agents on Common Mouth Bacteria

**Abstract:** What antibacterial agent is the most effective at eliminating common mouth bacteria? It is hypothesized that Clorox Greenworks will be the most effective antibacterial agent and will remain effective in 25% and 50% and 75% concentrations. Five substances will be tested, Clorox Greenworks, Lysol bathroom cleaner, Mouthwash, Purrell, and Distilled Water as a control. Bacteria will be swabbed from the scientists mouth onto blood agar plates and allowed to grow for 5 days. Bacteria will then be treated twice a day for 7 days with 10 ml of designated antibacterial agent. Bacteria levels on the agar plates will then be evaluated.

**Project Number:** MMH025

**Grade:** 7

**Title:** Songs For The Heart

**Abstract:** The purpose of my experiment was to see if music affects the heart rate. This could help patients at hospitals preparing for surgery. For my procedures, I took the test subjects and played slow and fast music. Then I measured their heart rates and recorded the results. I found the faster music increased the heart rate. Unlike the slow music which didn't reduce their heart rates much below their resting heart rate. In conclusion, the faster music caused an increase in their heart rate. Whereas the slower music didn't reduce the heart rate below the resting rate.

## INTERMEDIATE DIVISION – MEDICINE/HEALTH/MICROBIOLOGY

**Project Number:** MMH026

**Grade:** 8

**Title:** Tame The Stains Home vs Pro Bleaching

**Abstract:** The purpose of my experiment was to find out which whitening agent would whiten stained teeth the best. I chose this idea to do for the science fair because I have an interest in going to dental school and becoming an orthodontist. I like that dentistry is not only a science, but an art. With so many whitening agents on the market, my dilemma was: "Which whitening agent will whiten stained teeth the best?" I decided to use three different whitening agents. First, a professional whitening agent prescribed by a dentist. Second, a whitening toothpaste found at any grocery store and third, a homemade mixture of peroxide and baking soda. My hypothesis is that the professional whitening agent would be the most effective in whitening stained teeth.

**Project Number:** MMH027

**Grade:** 7

**Title:** Clean Up Your Act

**Abstract:** The project that I am doing is testing which areas of my school have the most bacteria. I taped off three areas and swabbed them daily. I put the swab on agar plates and watched the growth.

**Project Number:** MMH028

**Grade:** 8

**Title:** Do Students' Book Bags Weigh Too Much?

**Abstract:** The purpose of the investigator's project was to see if student book bags exceed the doctor recommended weight. The investigator tested 25 students in grades 3 through 8. Each student was tested 5 times. The investigator weighed each student each time and also weighed the student's backpack on the way into school in the morning. Results show that the majority of the students had book bags that weighed over 10% of their body weight. Eighteen out of 25 students had book bags that were over the doctor recommended weight.

**Project Number:** MMH029

**Grade:** 8

**Title:** Different Toilet Bowl Cleaners

**Abstract:** The purpose of this experiment was to find out if the cost of five different types of toilet bowl cleaners, Lysol, Clorox, Green Works, The Works, and Lil' Bowl Blu effected which would inhibit the most bacteria. For this experiment, I spread bacteria on agar plates and put the independent variables in four holes on the agar plates. The Works, the least expensive toilet bowl cleaner inhibited the most bacteria, thus refuting the hypothesis. The most expensive brand of toilet bowl cleaners, Lil' Bowl Blu was one of the least effective brands.

**Project Number:** MMH030

**Grade:** 8

**Title:** Blood Pressure vs. Exercise

**Abstract:** The purpose of my experiment is to see if your blood pressure changes due to exercise and if age affects it. Blood pressure is the force exerted by circulating blood on the walls of blood vessels. What I learned is that your blood pressure does raise after exercising. But, age didn't affect blood pressure as much as I thought.

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**Project Number:** MMH031

**Grade:** 7

**Title:** Which Contact Lens Solution Eliminates the Most Bacteria?

**Abstract:** To begin testing, I sterilized my work area with alcohol. A paper punch and nicrome wire loop was also sterilized. The sterile paper punch was used to punch paper discs into a sterile Petri dish. A back and forth and side to side motion was used to cover each nutrient agar plate with Staphylococcus Epidermidis. The paper discs were soaked in contact solutions for increments of fifteen minutes. The plates were taped shut and placed in an incubator set at 37 degrees Celsius for 48 hours. The plates were removed from the incubator and the zone of inhibition was measured.

**Project Number:** MMH032

**Grade:** 8

**Title:** Effect Of Sanitizers On S.epi & E.coli

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

**Project Number:** MMH033

**Grade:** 7

**Title:** Can Music Affect Your Heart Rate?

**Abstract:** Abstract: The purpose of my science project is to see what music affects your heart rate. I will sit my volunteers down, and take their pulses. After that I will have them listen to three different types of music: Rock, R&B and Hip-hop/Rap. After I play each type of music, I will take each person's pulse. From this project, I will learn what types of music can calm you down or make you more energetic. I think this will help people, because some people have health issues and raising your heart rate probably won't help.

**Project Number:** MMH034

**Grade:** 8

**Title:** Hot Flash or Cold Flash

**Abstract:** My purpose is to find if drinking hot liquids will increase your temperature. Also to find if cold liquids will lower your temperature. I had 20 people drink hot and cold liquids. Then I took their temperature five times after they drank. I found that the liquid does not affect their temperature. The temperatures were varied and were never consistent. My hypothesis was denied and I learned that the temperature of the liquid doesn't affect your temperature. This shows people that drinking liquids won't change your temperature and I could improve this project by changing the temperature of the liquids.

**Project Number:** MMH035

**Grade:** 8

**Title:** Which Mouthwash Is Most Effective?

**Abstract:** Mouthwash is key to having good oral hygiene. This experiment was intended to find out which mouthwash works the best. Fourteen over the counter mouthwashes, two prescription mouthwashes, and sterile water were tested to discover which had the best average zone of inhibition – 54 trials in all. Paper discs containing mouthwash were placed on agar plates streaked with the common mouth flora, Streptococcus salivarius, and placed in the incubator for 48 hours at 37.5 degrees Celsius. It was determined that Act Restoring

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worked the best. I think this is because of the active ingredient Cetylpyridinium Chloride (CPC). Future work is planned to test more strains of bacteria.

**Project Number:** MMH036

**Grade:** 7

**Title:** The Purity of Different Types of Drinking Water

**Abstract:** To begin my project, I sterilized my work area with rubbing alcohol. A dropper was used to measure 10 milliliters of the water that was being tested, and was then put in the Petri dish. After swirling the water over the agar, the excess water was removed. Then I taped each side of the Petri dish closed. I did twelve tests for each kind of water. I then inverted the Petri dishes and put them in the incubator, which was set for 37°C, and left them in it for 48 hours.

**Project Number:** MMH037

**Grade:** 8

**Title:** Sunscreen and SPFs

**Abstract:** In my experiment, I wanted to find out what sunscreen provides the best protection from the sun? I believe that the higher the SPF (sun protection factor) of sunscreen, the more it shields from the sun's ultraviolet rays. The sun produces three different types of light - visible light that we can see, infrared light that gives off heat, and ultraviolet light that penetrates the skin, causes burning, and may even lead to cancer. It is important to protect the skin with sunscreen when exposed to the sun. Sunscreen contains chemicals that filter light from the sun so that less ultraviolet rays reach the skin. Every sunscreen is rated with an SPF (sun protection factor) to show how much protection it should provide.

**Project Number:** MMH038

**Grade:** 7

**Title:** Can Yeast Grow in Other Flours?

**Abstract:** Traditionally, wheat flour and yeast have been used to make leaven bread. However, wheat is not always available because of weather conditions, and some people are unable to eat wheat due to celiac disease. This experiment was done to see if alternative flour could be used to grow the baking yeast, *Saccharomyces cerevisiae*. Wheat, garbanzo bean, and brown rice flour were mixed with yeast and water and allowed to grow for two hours. Samples were then counted under a hemocytometer. Of all the flours, wheat flour grew the best, but the yeast was able to grow in the other flours as well.

**Project Number:** MMH039

**Grade:** 8

**Title:** Wii Exercise. Do You?

**Abstract:** My project determines if certain video games, like Wii, increase your heart rate enough to be considered exercise. My hypothesis was that video games that require you to move will increase your heart rate as much as exercise. I had six volunteers play Wii Boxing and Wii Tennis for 10 minutes. Their heart rates were measured before and after playing. Activities that raise your heart rate >50% of your maximum heart rate is exercise. My results showed that each volunteers' heart rate reached the level to be considered exercise. Wii Boxing increased the volunteers' heart rates more than Wii Tennis.

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**Project Number:** MMH040

**Grade:** 8

**Title:** Super Soaps!

**Abstract:** The purpose of the experiment was to test the quality of various household antibacterial hand products. Subjects would wash their hands with various antibacterial soaps or expose them to antibacterial gels. Then hands would be swabbed and plate on agar plates. Over time, some bacteria grew on each test plate.

**Project Number:** MMH041

**Grade:** 7

**Title:** Antibacterial Dishwashing lqd.

**Abstract:** Many brands of dishwashing liquid have antibacterial properties which inhibit bacterial growth. However, there is limited information of antibacterial affectivity of expensive versus cheap dishwashing liquid brands. This study determines the difference of antibacterial activity showed by the diameter of inhibition zone on E. coli. Three brands of cheap dishwashing liquid (0.19 – 0.25 cents/ ml) and three brands of expensive ones (0.31 – 0.38 cents/ml) were compared. The zones of inhibition of cheap and expensive dishwashing liquid were similar, 18.7 and 18.6 mm, respectively. In conclusion, both price groups of dishwashing liquid have the same antibacterial affectivity.

**Project Number:** MMH043

**Grade:** 8

**Title:** Electronic Pollution

**Abstract:** The purpose of this project is to prove that cell phones do pose a hazard to the growth of yeast. I tested three household items and two cell phones to determine the amount of electromagnetic frequency radiation given off by each item. I exposed dishes inoculated with yeast to each item. Initially, there was no real change in any of the dishes. After 48 hours, however, most of the colonies had died. I learned that we do not know the long term effects of the electronic pollution given off by our commonly used items. Further research needs to be done in order to protect ourselves from the hidden dangers of EMF radiation

**Project Number:** MMH044

**Grade:** 7

**Title:** Wishy Washy

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

**Project Number:** MMH045

**Grade:** 8

**Title:** Hand Washing

**Abstract:** What's the best way for health care workers to get rid of bacteria on hands before going into operating rooms? The procedures were wash hands with cleaning products and follow directions on the products so that they were used the correct way; then made two swipes on a blood agar plate. Plates were put in an incubator for 48 hours then the colonies of bacteria were counted and recorded. The data showed that the Betadine scrub had 7 colonies, Chlorhexadine scrub 11, sanitizer 36, and soap 63. In conclusion Betadine scrub is the best cleaning product used in experiment.

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**Project Number:** MMH046

**Grade:** 7

**Title:** Sports Drinks, Tooth Decay & Daily Rinsing

**Abstract:** A study by the University of Maryland Dental School has shown that acidic beverages can cause tooth decay, especially certain sports drinks, and that rinsing teeth with water would reduce the tooth decay. To test these findings, I obtained 14 extracted and sterilized human teeth from a dentist, found each tooth's mass, then x-rayed and measured the length and width with a digital caliper. The teeth were soaked in the test beverages and water for 10 days. Seven of the teeth were also rinsed and dried each day. The pH of each beverage was tested initially and daily. I then measured the mass of each tooth and x-rayed them again, and then found the amount of decay of each tooth by comparing the original to the final x-ray. My research found that Propel and Red Bull caused the most decay, and rinsing the teeth with water did reduce the amount of tooth decay.

**Project Number:** MMH047

**Grade:** 7

**Title:** Mold Growth

**Abstract:** This experiment was to test different breads, in different conditions, to find which bread would grow mold first. Taking slices of white, wheat, and homemade breads, 9 slices, I placed each condition, a countertop, refrigerator and a breadbox. Results were recorded daily. Day 7 showed the first growth of mold on the homemade bread on the countertop and in the breadbox. Day 14, after the experiment ended, showed mold growth on wheat bread on the breadbox. Preservatives make a difference and with refrigeration even more in mold growth.

**Project Number:** MMH048

**Grade:** 8

**Title:** Identifying Vitamin C Content

**Abstract:** The purpose of the experiment was to find out which orange juice had the highest vitamin C content. To calculate this a water, cornstarch solution was made. Mix it with the orange juice. Next, add drops of iodine to find the vitamin C content. Add drops of iodine one by one until the orange juice turns purple. The more vitamin C, the more drops needed. Do this three times to find an average. The fresh juice had the most vitamin C, needing an average of 8.3 drops to turn purple. Second was the frozen juice needing an average of 8 drops to turn purple, and carton juice was third needing 6.6 drops. Leaving canned juice to have the lowest vitamin C content, only needing 5.3 drops to change the color of the orange juice. The hypothesis was supported. The fresh juice had the highest vitamin C content

**Project Number:** MMH049

**Grade:** 8

**Title:** Is Reading Hazardous to Your Health?

**Abstract:** Books and magazines in public places may be handled by many people. The purpose of this project was to determine if germs are present on the reading materials and, if so, to determine if they could cause illness. Samples were collected from books and magazines that would be read by adults and children of various ages at a number of locations, including school and public libraries, a daycare center, and medical and dental offices. Cultures were grown and the results varied considerably between locations. The highest bacterial colony counts were at locations where children visit. No pathogenic organisms were found.

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**Project Number:** MPH001

**Grade:** 8

**Title:** Does Temperature Affect Viscosity?

**Abstract:** The purpose of my research was to prove if temperature affects the viscosity of water. I heated or cooled distilled water to a predetermined temperature. Then poured 500mL of the water into a graduated cylinder. Then I dropped a marble into the cylinder while timing its descent to the bottom. I test each temperature of water fifteen times. The water at 50 degrees Celsius average was 0.59 seconds and the water at 5 degrees Celsius average was 0.90 seconds. This data supported my hypothesis that higher temperatures cause lower viscosity and lower temperatures causes higher viscosity.

**Project Number:** MPH002

**Grade:** 8

**Title:** Reflection and Refraction of Light

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

**Project Number:** MPH003

**Grade:** 8

**Title:** Two or Three?

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

**Project Number:** MPH004

**Grade:** 7

**Title:** Keeping It Cool

**Abstract:** The purpose of my experiment was to determine if a soft-sided cooler was better than a hard-sided cooler. I used a digital thermometer hooked up to a USB port. I froze water in a plastic cup. I put the ice in the cooler for 6 hours and measured the temperature. I took the ice out and poured the water into a different cup. I measured the water in a graduated cylinder. After I measured the water, I put my results in a table. I reviewed my results and I proved that my hypothesis was wrong, the hard-sided cooler was better.

**Project Number:** MPH005

**Grade:** 7

**Title:** Save the Earth: Change a Light Bulb

**Abstract:** In the midst of the economic and energy crises, America needs to save energy. This experiment was conducted to find out whether the newer, compact fluorescent, ENERGY STAR approved light bulbs are more efficient than standard, incandescent light bulbs. To collect the data, the light and heat produced by five different types of light bulb were measured from a distance of three, eighteen, and thirty-three centimeters. From three centimeters, the ENERGY STAR light bulbs were significantly more efficient, but from longer distances, the differences between the light bulbs were negligible. Overall, ENERGY STAR light bulbs were the most efficient.

**Project Number:** MPH006

**Grade:** 8

**Title:** How Sound Travels

## INTERMEDIATE DIVISION – PHYSICS

**Abstract:** The purpose of the experiment is to see which material makes the best insulator. The procedure is to first, go to a quiet room and place the music box on the table to record the sound. Second, hold the decibel reader one inch away from the music box. Third, take five separate readings on each soundboard using the A scale. Fourth, take five separate readings on each soundboard on the C scale. Fifth, calculate the average dB reading for each soundboard material. The soundboard materials are tin, wood, plastic cooler lid, stadium cushion, carpet, and the control. Tin had 65.9 dB on the A scale and on the C scale it was 72.7 dB. Wood had 67.9 dB on the A scale and 76.6 dB on the C scale. The plastic cooler lid had 66.3 dB on the A scale and 76.1 dB on the C scale. The stadium cushion had 64.2 dB on the A scale and 77.6 dB on the C scale. The hypothesis was not supported by the data. The loudest insulator on the A scale was the control with 77.8 dB. The loudest insulator on the C scale was the carpet with 79.3 dB. In the real world, insulators can be used to keep sound out like in recording studios. Or they can be used to make sound louder like in amplification theaters.

**Project Number:** MPH007

**Grade:** 7

**Title:** Bigger is Not Always Better

**Abstract:** Have you ever wondered what happens when we run out of fossil fuels? I have wondered and I came up with a solution. Solar Power ! Solar power is one of the greatest technologies that people have developed . Solar power is energy from the sun. One of solar energy's greatest technologies is called solar concentrators. Solar concentrators concentrate light rays into one small spot which generates heat. Solar concentrators' energy can be stored as well. My project used a solar concentrator with large and small mirrors to see which generated more heat. The concentrator with smaller mirrors generated more heat.

**Project Number:** MPH008

**Grade:** 8

**Title:** How do the materials on a wall affect how far I can hear the sound?

**Abstract:** The purpose of experiment is to see how far sound can be heard when projected at different materials and how to get the loudest sound. I think that the materials on a wall greatly affect the sound and how far the sound can be heard. The reason for this project was to determine the material that would produce the loudest sound. I will find this out by aiming a radio at the material and then see how far I can go before I stop hearing the sound. I will use 5 different materials: cardboard, the plain wall, wood, cloth, and a towel.

**Project Number:** MPH009

**Grade:** 8

**Title:** Creating a Stronger Truss

**Abstract:** How would an engineer know which type of truss design is better for weight support? This experiment tested this question by comparing the maximum weight support of an arch beam truss design and a cantilever truss design. Weights were added to the truss designs until they snapped. Several trials for each design were repeated. The data shows that the cantilever truss was able to hold more weight before breaking. The results of this experiment supported my hypothesis.

**Project Number:** MPH010

**Grade:** 8

**Title:** Blazing Lights!

## INTERMEDIATE DIVISION – PHYSICS

**Abstract:** My experiment was to see if darker colors absorb more heat than the shiny bright colors. I picked this as my topic because every summer I would always wonder why everyone says doesn't wear dark colors in the summer. My problem was: "Is it true that darker colors absorb more heat than shiny, bright objects?" My hypothesis was that this was a true statement.

**Project Number:** MPH011

**Grade:** 7

**Title:** Get Set, SHOOT!

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

**Project Number:** MPH012

**Grade:** 8

**Title:** Eyes vs. Ice

**Abstract:** The purpose of this experiment is to help those who take ice-skating lessons and perform spins. Some spins create dizziness therefore; this experiment will test to see how eye position and head position affect dizziness. Three different skaters completed 42 scratch spins with different eye and head positions. The data collected concluded that dizziness does not change with your head and eyes position but the quality of the spin is affected with your head and eyes position. The best position during a scratch spin is placing your head straight and your eyes open.

**Project Number:** MPH013

**Grade:** 7

**Title:** How Many Wood It Take?

**Abstract:** I titled my project: "How Many Wood It Take?" My question was: What is the hardest type of wood? I hypothesized that oak would be the hardest because of the research that I did and the fact that oak was smooth creating a better drive. To do this project, I needed something to pound the nail with the same amount of force consistently. So I built a hammer drop to test the eight different woods. In conclusion, I found out that locust was the hardest type of wood. The piece of locust caused the nails to bend on all three trials. Therefore my hypothesis was incorrect. Oak was not the hardest wood.

**Project Number:** MPH014

**Grade:** 7

**Title:** Which salt best melts ice?

**Abstract:** The purpose of this experiment is to find out which type of salt most effectively melts ice. I will make trays of ice and then melt each ice sheet with either rock salt, table salt, kosher salt, or sea salt, I will time the salt until all of the ice is melted then repeat each trial five times to ensure reliable results. I have not yet completed this investigation and until I do can not come to a conclusion.

**Project Number:** MPH015

**Grade:** 7

**Title:** What Affects Bat Speed the Most?

**Abstract:** The purpose of the investigator's project was to see which characteristic of a bat (weight or length) has a greater effect on bat speed. The investigator tested two bats that were

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of equal length and different weights. He also tested two bats that were of equal weight and had different lengths. He had batters hit a series of six baseballs using each bat and the bat speed was recorded using a radar gun. This investigator's hypothesis was proven incorrect. The length of a bat was found to be a stronger determinant of swing speed, even within a wide range of bat weights.

**Project Number:** MPH016

**Grade:** 8

**Title:** Water Balloon Catapult

**Abstract:** The purpose of this experiment is to test two kinds of water balloons with a catapult. These two types of balloons were a solid water balloon and a liquid water balloon. Here are the procedures. First gather all of the materials. Next build the catapult. Then take all six balloons and fill them with 237mL of water each, then take half and freeze them. The solid water balloons went further than the liquid balloons. Combined, the solid water balloons went 1,132cm and the liquids went 966cm. In conclusion the solid water balloons went further than the liquid water balloons.

**Project Number:** MPH017

**Grade:** 7

**Title:** How Tee Height Affects Your Drive

**Abstract:** The purpose of this experiment is to find out how high to tee up a golf ball to get maximum distance. The procedures were to gather materials and assemble the machine. To do that you set up the tri-pod and clamp the bracket to the top of it. Put the pivot on the club handle and slide it into the bracket. Tee the ball up and pull the club back so it swings down and hits the ball. Repeat that 8 more times for each tee. Data showed that the highest tee went the farthest. My hypothesis was valid

**Project Number:** MPH018

**Grade:** 8

**Title:** Magnetic Descent

**Abstract:** Purpose: to figure out if gravity plus magnetism affects the descent of an object. Hypothesis: I think the magnet will fall faster because its being pulled by two forces. Procedure: 1. Drop a magnet over a metal lid and record how long it took to hit the lid. 2. Then you drop an object of about the same size and record how long it took to hit the lid. 3. Repeat steps one and two twenty times. Conclusion: sixty percent of the time the magnet took less time to hit the ground than the un-magnetized object did.

**Project Number:** MPH019

**Grade:** 7

**Title:** Which Type of Metal Is The strongest?

**Abstract:** The purpose of the investigator's project was to see which metal was the strongest and least corrosive. The investigator tested A36 steel, 6061 aluminium, 110 copper, 304 stainless steel and 932 bronze. The investigator used a GAKA 70/S 70 Metric Ton Hydraulic press to test the strength of the metals. He recorded the KSC required to shear each metal. Then, he used hydrochloric acid to test the corrosion resistance of the various metals. The investigator concluded that the stainless steel was the strongest metal. The corrosion test had inconclusive results.

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**Project Number:** MPH020

**Grade:** 7

**Title:** Does the Brand of Hockey Stick Affect the Distance a Puck Travels

**Abstract:** I will create a test to determine whether the wooden or composite differ in the distance a hockey puck travels. To do this I will construct a device that will hit a hockey puck with equal force each time it is swung. Each stick will be swung and strike the puck thirty times each. I will then measure how far the puck travels and determine which hockey stick hits the puck a farthest.

**Project Number:** MPH021

**Grade:** 8

**Title:** "Stretching" the Life of the Earth

**Abstract:** The purpose of my project is to see if environmentally friendly fabrics can withstand equal or greater amounts of force applied before tearing than ordinary fabrics. Ordinary fabric's materials are grown with pesticides and other chemical which are harmful to the environment. Using Newtons to calculate the total amount of force that needs to be applied I hope to determine the fabric average strength and compare then to see if chemicals affect the plants product.

**Project Number:** MPH022

**Grade:** 7

**Title:** Generating Thermoelectricity

**Abstract:** Creating electric energy out of thermal energy is known as the Seebeck effect. The problem studied was which conductive materials generated the most thermoelectricity. To create thermoelectricity, a closed loop circuit was made by joining the ends of two wires of dissimilar metal. One junction was heated and another was cooled. The millivolts of thermoelectricity generated were measured with a voltmeter. In total, four different wire materials in different combinations were studied. The average of three tests for each combination was then calculated. The pairing of copper and stainless steel generated the most thermoelectricity, an average of 3.67 millivolts, when compared to the other wire materials studied.

**Project Number:** MPH023

**Grade:** 8

**Title:** Egg in a bottle

**Abstract:** Will an egg fit into a bottle when the egg is larger than the opening, without touching egg. Increased the temperature of air molecules in bottle using fire. Put the egg on the opening of the bottle. When the fire goes out the egg was pushed in. Used three different sized eggs. Air molecules inside bottle cooled and moved together. Pressure inside bottle becomes less. Pressure from outside bottle pushed egg into the bottle. Small egg took 26 seconds to enter bottle. Medium egg took 9 seconds. Jumbo took 12 seconds.

**Project Number:** MPH024

**Grade:** 7

**Title:** Projectile Passengers

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

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**Project Number:** MPH025

**Grade:** 8

**Title:** Gas Mileage and Tire Pressure

**Abstract:** Does tire pressure have an effect on gas mileage? When gasoline prices are at record highs and gas is in short supply, this is an important question to ask. The mileage is effected by tire pressure. By utilizing the same vehicle filled with the same octane of gas the tire pressure was manipulated to find the optimal pressure which will yeild the highest mileage. The vehicle was driven under the same raod conditions approximately 100 miiles each trip. Five different tire pressures 26, 28, 30,32 and 37 p.s.i. were analyzed. The results have shownen that the optimal tire is thirty seven p.s.i, but this overinflation of tires caould cause greater wear on the tires.

**Project Number:** MPH026

**Grade:** 7

**Title:** The Durability of Reeds

**Abstract:** Woodwind instruments require a reed to make a sound. The purpose of my experiment is to compare the newer synthetic reeds to the standard cane reeds to determine if the synthetic reeds are more durable and produce better sound than cane reeds. In my procedure I replicated the conditions that a reed undergoes with normal use. This involves a cycle of wetting, playing, and drying. Performance and physical characteristics were evaluated. The changes in physical characteristics were subtle but occurred more often in the cane reeds. Better and more consistent performance characteristics were observed with the synthetic reeds.

**Project Number:** MPH027

**Grade:** 8

**Title:** Faraday's Law of Induction

**Abstract:** My science project was to test Faraday's Laws of electromagnetic induction, which are: (1) an electromagnetic force is induced in a conductor if the magnetic field surrounding it changes, (2) the electromagnetic force is proportional to the rate of the field, and (3) the direction of the induced electromagnetic force depends on the field's orientation. I constructed a working transformer and tested the previously stated laws with various combinations of coils and various power sources. Using the ideal transformer equation I calculated the expected output voltage of the transformer. The Efficiency was calculated from Actual Voltage divided by Expected Voltage.

**Project Number:** MPH028

**Grade:** 8

**Title:** Temperature's Effect on Rubber Balls

**Abstract:** The purpose of this experiment was to find out if temperature had any effect on the height of the bounce of rubber balls. For the procedure, assemble a prototype in which to use to measure the bounce of the balls. This was made out of cardboard, graph paper, and a tube to drop the balls through. Then, using a digital camcorder, record the bounce of each of the 5 rubber balls at room temperature for the control. Then it was slowed down picture to get the measurements. Place balls in boiling water and freezer and repeat the steps. The data is as follows; for the room temperature ball 1 was 45.72 centimeters, ball 2 was 50.8, ball 3 was 50.8, ball 4 was 48.26, and ball 5 was 50.8, for an average recoil of 49.276. For the boiled

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rubber balls, ball 1 was 45.72, ball 2 was 53.34, ball 3 was 43.18, ball 4 was 50.8, and ball 5 was 53.34 centimeters; for an average rebound of 49.276 centimeters. For the frozen rubber balls, ball 1 was 45.62, ball 2 was 50.8, ball 3 was 50.8, ball 4 was 45.72, and ball 5 was 40.64; for an average bounce of 46.736. In conclusion, the data shows that the room temperature rubber balls and the boiled balls have the same exact results, while the frozen balls bounce much lower.

**Project Number:** MPH029

**Grade:** 7

**Title:** Which Best Lubricates Metal?

**Abstract:** Lubrication is of major importance in our society. This project was to find which household item best lubricates metal. Each lubricant was spread down a piece of gutter, and an object was placed down the gutter. The times were calculated for each type of lubricant. It was determined that cooking spray was the best lubricant, followed by Softsoap, vegetable oil, then Crisco.

**Project Number:** MPH030

**Grade:** 7

**Title:** Got Bounce?

**Abstract:** I will design a test to determine if temperature affects the distance a tennis ball travels. After constructing a device in which tennis balls can be hit constantly with the same force, pressure-less tennis ball will be heated to 37 degrees celcius, chilled to -5 degrees celcius, and left at room temperature of 25 degrees celcius for 96 hours before testing to determine if temperature has an effect on the distance a tennis ball travels.

**Project Number:** MPH031

**Grade:** 7

**Title:** Chill Out

**Abstract:** I wanted to see if hot water froze faster than cold water. First I put 200 ml of water in the pot on the stove for 2 minutes. I put 200 ml of water in the refrigerator for 8 minutes. I took their temperatures and covered the beakers. I put them in the freezer for one hour. I checked the beakers to find which one had frozen to 1-3 C. The hot water froze at the same rate as the cold water.

**Project Number:** MPH033

**Grade:** 7

**Title:** Light Wavelengths and Solar Cells

**Abstract:** The purpose of this investigation is to find out if different colors of light affect how much energy a solar cell produces. To conduct this investigation I placed the solar cell under a workshop lamp, placed a color filter between the solar cell and the light, and recorded the results. The results are recorded by the average amount of rotations per 15 seconds, blue 65, purple 62, white 56, green 53, yellow 45, orange 45, and red with 43. It turns out that the colors with shorter wavelengths blue, purple, and green produced the most energy.

**Project Number:** MPH034

**Grade:** 8

**Title:** Factors that influence Strength of Electromagnets

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

**Project Number:** MPH035

**Grade:** 8

**Title:** Are Green Building Materials Better than Conventional Ones?

**Abstract:** The purpose of this experiment was to determine whether or not green building materials are a stronger and more cost effective alternative to conventional building materials. Tensile strength of Pine board verses Trex board was determined utilizing weights. The resistance of pine to withstand fracture was 300% greater than Trex. Strength of recycled verses non-recycled carpet was tested utilizing a brush to mass the amount of fibers removed. Recycled carpet was 30% weaker than non-recycled carpet. Conventional building materials are stronger and are more cost effective than recycled building materials.

**Project Number:** MPH036

**Grade:** 7

**Title:** Singing Ice

**Abstract:** Dry ice is frozen CO<sub>2</sub>gas. Dry ice emits sound wave when a warm or room temp. spoon because of sublimation or when dry ice is evaporating. I examined the sound pitch produced when a spoon is held lightly against dry ice. I measured the pitch using NCH software called Pitch Perfect. I positioned my hand at 3 different points on the spoon at 10.00cm, 5.00cm, and 1.00cm. I noticed that as I got closer the end of the spoon the pitch increased. The averages to my measurements were 10.00cm-7129.07 Hz, 5.00cm-7129.974 Hz, and 1.00cm-7136.421 Hz.

**Project Number:** MPH037

**Grade:** 8

**Title:** Solar Panel Efficiency

**Abstract:** This purpose of this investigation was to learn how to harvest the most environmentally friendly energy in efficient manner. I placed solar panels at different angles then using a digital multimeter measured the voltage and current of the solar panel. After completing the investigation I can draw the following conclusion; the study was done in the winter months, and a 90 degree angle was the most efficient in harnessing the sun's energy.

**Project Number:** MPH038

**Grade:** 8

**Title:** how does friction affect a moving object?

**Abstract:** This experiment was about how friction affects a moving object. I did this by rolling a ping-pong ball on 3 different surfaces. My surfaces were wood, carpet and a cloth towel. The purpose of this experiment was to show how friction affects a moving object. The results were that different types of textures have different amounts of friction. I found that the carpet had the most amount friction.

**Project Number:** MPH039

**Grade:** 8

**Title:** Nozzle Size Impact on Rocket Thrust

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**Abstract:** The purpose for my experiment is to determine the different distances a rocket travels by changing various sizes of nozzles, in length and diameter, using constant air pressure. The largest nozzle 1.27 cm diameter went the least distance. The smallest nozzle, 0.64 cm diameter, traveled the longest distance. The .95 cm diameter's results were in between those from the other two PVC tubes. The length of the nozzle did not have significant impact to the results. The data supported my hypothesis because I believed the smaller nozzle would travel the farthest, which it did, because the nozzle would concentrate the air more creating the most thrust.

**Project Number:** MPH040

**Grade:** 7

**Title:** Archimedes Principle

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

**Project Number:** MPH041

**Grade:** 7

**Title:** Wavelength & Solar Cell Energy

**Abstract:** Solar energy is becoming a more popular alternative energy source. The work is intended to determine if changing the wavelength of light entering a solar cell will improve its efficiency. Seven different colors were used on the solar panel and the energy output was recorded. It was determined that the shorter the wavelength, the higher energy output. The longer wavelength colors were less consistent in energy production. Wavelengths are not the only variable in solar cell energy production. Solar cell technology is still evolving and more research is needed to produce an efficient solar cell.

**Project Number:** MPH042

**Grade:** 7

**Title:** Are Cheerios Magnetic?

**Abstract:** I tested four cereals, two with reduced iron and two with iron. The cereals were Life, Cheerios, Raisin Bran, and Total. My hypothesis was that the cereals with iron would be more magnetic than the cereals with reduced iron. My hypothesis was wrong. It ended up that it wasn't the iron or reduced iron in the cereal it was how highly concentrated the cereal was. Total came in first because it had 100% of your daily recommended allowance.

**Project Number:** MPH043

**Grade:** 8

**Title:** Here Comes the Sun

**Abstract:** This experiment is a comparison between active and passive solar energy systems in terms of cost and efficiency. Two Styrofoam model "homes" were constructed to represent each system. In the active system, sunlight will heat up the air in a solar collector. In the passive, sunlight will enter directly through a window. Both homes were placed outside together on six sunny days in the afternoon, and the temperatures were recorded inside each home for two hours every fifteen minutes. The temperatures rose considerably higher in the passive home for all six days and this system was less costly to construct.

**Project Number:** MPH044

**Grade:** 7

**Title:** Burn Baby Burn

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**Abstract:** In my project I took gasoline and diesel fuel and burned very small amounts of fuel under a can of water. I did this to see which fuel contained more energy. My hypothesis was that diesel would raise the temperature of the water higher than the gasoline would by burning the fuel. This would help me find which fuel is more energy efficient. To do this I burned the fuel under a tin can outside. Then I used the water temperature from before and after to calculate the temperature difference of water. My hypothesis was correct. The diesel gave off more energy and the energy was absorbed by the water; therefore, the water temperature went up. I concluded that, diesel fuel is more energy efficient per gallon.

**Project Number:** MPH045

**Grade:** 8

**Title:** The Photoelectric Effect

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

**Project Number:** MPH046

**Grade:** 8

**Title:** How Far Can Sparks Jump?

**Abstract:** I did this experiment because I was very interested in the generation of sparks and I wanted to prove that sparks can jump great distances and can be hazardous. I used small ball bearings and a grill igniter to generate a spark. Once I got a spark, I used different materials to see if they acted as conductors or insulators. The greatest spark jump was 10mm, using the aluminum foil. In conclusion, my experiment can help many people. It can help prevent accidents and my results showed that sparks can be very harmful to those who work with them.

**Project Number:** MPH047

**Grade:** 8

**Title:** Aerodynamics

**Abstract:** The purpose of the experiment was to see how aerodynamics affect the performance of a vehicle. The experiment was done by blowing air against a toy car. Then measured how much wind it took to push the car off of a piece of tape. The cars used were an SUV, a sports car, a race car, and an exotic car. The SUV performed poorly because of being boxy. The sports car did better because it was more rounded. The race car did well but the purpose of the experiment was to see how aerodynamics affect the performance of a vehicle. The experiment was done by blowing air against a toy car. Then measured how much wind it took to push the car off of a piece of tape. The cars used were an SUV, a sports car, a race car, and an exotic car. The SUV performed poorly because of being boxy. The sports car did better because it was more rounded. The race car did well but it created down force. Lastly, the exotic car did the best because it was streamlined. it created down force. Lastly, the exotic car did the best because it was streamlined.

**Project Number:** MPH048

**Grade:** 8

**Title:** Its Not the Length That Counts...It's the Angle

**Abstract:** The purpose of the experiment is to determine the best kicking angle for sports. To do the project, build a right triangle wooden stand. Perform several trials for accuracy. The data shows that the average for 25° was 82.3 cm., for 30° angle the average was 83.8 cm., 35° angle had 85.3 cm., 40° had 86.4 cm., 45° angle had an average of 86.9 cm., the average

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for 50° angle was 80.8 cm., 55° had an average of 64 cm., and 60° angle had an average of 49.3 cm. Research shows that 45° was the best kicking angle for sports. The ending result results also show that 45° went the farthest.

**Project Number:** MPH049

**Grade:** 8

**Title:** Circuit City

**Abstract:** The purpose of this project is to determine the effect resistors have on the charge and discharge time of the capacitor. In order to begin testing it will be necessary to gather the needed materials and set up a circuit consisting of a switch, a capacitor, a resistor, a battery, and a breadboard to connect these components. When the switch is flipped, Vernier software will be used to calculate the charge and discharge time of the capacitor. The results will be recorded until 10 tests results are completed per resistor.

**Project Number:** MPH050

**Grade:** 8

**Title:** Analysis of solar liquid heater efficiency

**Abstract:** My hypothesis was that the black dye will warm up quicker and more efficiently by absorbing infrared energy radiated from the inner wall of the pipe. I built a small solar water heater by soldering copper tubing onto a metal sheet, and then painted it black. I heated the pipes with an infrared heat lamp. The difference in energy absorbed by the black dye versus clear water was 70 joules. My hypothesis was correct, the black food coloring got warmer quicker. Hopefully, this experiment will inspire other engineers to test the use of black dyes in solar water heaters.

**Project Number:** MPH051

**Grade:** 7

**Title:** Trussworthy

**Abstract:** The problem I wanted to solve is what kind of truss bridge, holds the most weight. Also, which one would be the cheapest to build. I constructed different trusses, made a crushing mechanism, and applied various weights. The triangle truss was the most efficient.

**Project Number:** MPH052

**Grade:** 8

**Title:** The Effect of Construction Materials on Sound Absorption

**Abstract:** The purpose of my experiment is to determine which of five different construction materials absorbs and reduces the sound of noise best. I evaluated their sound absorption with the use of a decibel meter. The data collected in my experiment showed that each of the materials tested absorbed sound differently as measured by the decibel meter, but the difference was not always distinguishable by ear. In the end, it was determined that the thickest and most porous material, fiberglass insulation, absorbed sound best. The next best sound absorbing material was ceiling tile. This was followed by Berber carpet, drywall, Styrofoam insulation, and finally the cardboard of the shoebox itself.

**Project Number:** MPH053

**Grade:** 7

**Title:** What A Drag

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**Abstract:** The reason why I did this project was because I always wondered how a parachute worked. I dropped three parachutes(a rounded parachute, a triangular parachute, and a rectangular parachute) from on top of a ladder on my porch, on top of my stairs, and on top of my roof. The rounded parachute did the best out of the three it's final time was 13.80 seconds the rectangular parachute's final time was 12.51 and the triangular parachute had a total time of 10.61.

**Project Number:** MPH054

**Grade:** 8

**Title:** The Art of Placekicking

**Abstract:** The purpose of my experiment was to see if it mattered if the position of the laces on a football would affect the distance it travels. My procedures are to get a 2x4, lay down next to it and mark at the hip and toe. Then put the football on the tee and the 2x4 on a paint can, and drop 2 5 pound weights on the end that is sticking up in the air. My conclusion is that instead of the laces being positioned at 90 degrees left it went the farthest at 0 degrees.

**Project Number:** MPH055

**Grade:** 7

**Title:** Electrical Charge and Fruit

**Abstract:** The purpose was to determine if fruit with higher water content has a greater electrical charge than fruit with low water content. Cut each fruit 3cm X 3cm X 3cm pieces. Insert test leads of multimeter into fruit. Record highest number of amps and highest number of ohms.Repeat for each fruit.None of the fruits carried an electrical charge. Each measured for resistance. The tomato had the highest water content , had the highest resistance. The hypothesis was not supported, because it does not carry a measurable electrical charge.

**Project Number:** MPH056

**Grade:** 7

**Title:** The Spectrgraphic Analysis of Color Mixing

**Abstract:** I plan to build a spectrometer. I then will conduct the experiment by making and combining colors to create filters. Then, I plan to put the filters in front of the light and examine the spectra. I am trying to determine what will happen when secondary colors are used in the spectra.

**Project Number:** MPH057

**Grade:** 7

**Title:** Are Triangles Really the strongest Geometric Shape?

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

**Project Number:** MPH058

**Grade:** 7

**Title:** Which produce item will cause the best voltage, current and power?

**Abstract:** Grapefruits and potatoes are opposites, but which will work better as a battery? I have decided to conduct this experiment because I would like to know how to make a battery out of a vegetable/fruit, also because I have always wondered whether a citrus fruit or a potato will make a better battery having better resistance, power, current, voltage, and energy. I will

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try to power an old stopwatch by connecting wires to the voltage meter, the grapefruit, and the stopwatch. This will also be done with the potato.

**Project Number:** MPH060

**Grade:** 8

**Title:** All Soaked Up

**Abstract:** A) I wanted to investigate this topic because I like physics. My problem is which wood will float the longest. My hypothesis was that the spruce will float the longest. B) I poured water into 5 bowls and placed the wood into them. I measured them everyday and recorded it. C) I found out that the spruce floated the longest, and the oak sunk the quickest. D) In conclusion my hypothesis was correct that the spruce floated the longest.

**Project Number:** MPH061

**Grade:** 8

**Title:** Relationship Between Color and Absorption of Light?

**Abstract:** This experiment was done to observe what effect light has on color. A rectangular bottle was filled with water measuring 22 degrees Celsius. A thermometer was inserted in the bottle and the bottle was covered in one of five different colors of construction paper during each trial. It was placed in front of incandescent light. At the end, it was recorded that the colors violet and red absorbed the most amount of light and had the greatest difference in temperature. Those results matched the extremes of the visible area of the spectrum.

**Project Number:** MPH062

**Grade:** 7

**Title:** Trumpet Mutes Effect on Trumpet Sound

**Abstract:** The experiment's purpose tested which trumpet mute had the greatest trumpet sound reduction in decibels. Through the experiment the trumpet mutes were placed in the trumpet bell and a decibel reading was taken for each trumpet mute. The trumpet with no mute had a reading of 86 decibels. A straight mute measured 80 decibels, a plunger mute measured 80 decibels, a cup mute measured 77 decibels, and a Harmon mute measured 74 decibels. Through this experiment it was concluded that the Harmon mute had the lowest decibel reading of all the mutes.

**Project Number:** MPH063

**Grade:** 8

**Title:** Salt the Under Current

**Abstract:** Due to clean energy being a major concern in the modern world, we are always searching for ways to manufacture a great deal of energy with little or no environmental effects. If there is a possibility that hydro-electric generators can be ran with the equivalent amount of salt and distilled water and the salt water will produce more energy thus we could solve Americas and the worlds energy crisis by using the currents from the ocean. For the experiment, a micro-hydroelectric generator was built. Then different salt concentrations and distilled water where ran through the generator, there was an identical amount of water for every different concentration and the flow was kept constant by a funnel. Results demonstrate that distilled water on average produces .002 volts of electricity. A water solution that contains 378 ml of salt, 10%, produces .0025 volts, 1,144 ml, 30%, of salt in a water solution produces .00175 volts, and 1,890 ml, 50%, generates .0035 volts. Lastly, a solution containing 2,646 ml of salt, 70%, creates .00125 volts of power. For that reason, if there is the precise quantity of salt in the water it will produce further energy then the distilled water will. On the other hand, if

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the salt concentration is excessively high the water will become to thick and heavy that it will no longer be able to turn the turbine and thus produce less overall energy.

**Project Number:** MPH064

**Grade:** 8

**Title:** To Port or not to Port

**Abstract:** The purpose of my experiment, To Port Or Not To Port, was to discover if a ported or sealed speaker had a better low frequency response. I built two speakers and tested them with a dB meter to discover which one had a better low frequency response. I ran the test twice changing a few things the second time that I believed I did wrong the first time. I wrote my information out in tables and then graphed it so I could see the results. In conclusion, the ported speaker has a better low frequency response because it hits lower frequencies.

**Project Number:** MPH065

**Grade:** 8

**Title:** Aluminum Air Battery

**Abstract:** The purpose of the experiment is to determine which creates a higher voltage, an Aluminum Air Battery compared to commercial batteries. The procedure of this experiment is to construct an Aluminum Air Battery out of aluminum foil, paper towel, saltwater, and activated charcoal. The battery is tested on a 6-volt flashlight bulb. Then, the voltage is compared to those of branded batteries. Data was collected throughout the experiment. The results were that the Aluminum Air Battery produced .5V, while the leading brands of Duracell, Energizer, GP Alkaline, and Rayovac emitted 1.5V. Next, the ohms of the batteries were tested and the Aluminum Air Battery had 30 ohms, while Duracell had 2, Energizer 4.5, GP Alkaline 4, and Rayovac 2. Then, the quantity of amps that the Aluminum Air Battery had was .016A, while Duracell had .75A, Energizer .333A, GP Alkaline .375A, and Rayovac .75A. Finally, in conclusion an Aluminum Air Battery produces a lower voltage compared to commercial batteries. But the Aluminum Air Battery has the highest amount of ohms, and lowest sum of amps, compared to the commercial batteries that were tested. The real-world implication that is expressed through this data is the information it provides towards inventing a battery produces useful amounts of energy from an inexpensive, nontoxic, and recyclable material; such as aluminum.

**Project Number:** MPH066

**Grade:** 8

**Title:** Electromagnets, Future Energy Source

**Abstract:** I choose to do this project because of the need for alternate energy sources in our country. I wanted to find out if electromagnets could be used as an alternate energy source. First I built a model of Faraday's eclectic generator. Next then gathered and tested the strengths of my magnets. I then tested the amount of electricity produced my each magnet on the electric generator. Last I recorded my results in my table. My strongest magnet produced more electricity and my weakest magnet produced the least. The stronger the magnet, the more electricity produced. As for an alternate energy source i learned you can not get energy from nothing.

**Project Number:** MPH067

**Grade:** 8

**Title:** Music On Ice

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**Abstract:** The purpose of this experiment was to determine what type of music improves the completion of a figure skating jump pattern. Procedures in my investigation included, completing a waltz jump pattern 10 times to each song, video recording each jump, and then from the video recording completing calculations in order to compare the type of music and the quality of the waltz jump. My data compared the different outcomes of the waltz jump with the different types of music. In conclusion, the data showed that Pop and Country music produced the best waltz jumps for the participants in this experiment.

**Project Number:** MPH068

**Grade:** 7

**Title:** The Perfect Shot

**Abstract:** The purpose of the experiment was to see if you shot a ball from different positions, if one increases your percentage more then the others. For this experiment I made a catapult and shot a tennis ball into a hoop nine times from the three different positions. My hypothesis was partly valid because I said the head position was going to be the best percentage, but both the head and above head positions had the best percentage. The conclusion for this experiment is the chest position had four shots and the head and above head had five successful shots.

**Project Number:** MPH069

**Grade:** 7

**Title:** The Waves and the Pressure

**Abstract:** The purpose of my experiment was to see if radio waves are slowed by air pressure. I hypothesized that higher air pressure would slow radio waves faster than than low pressure. I used walkie-talkies, a flashlight, and a stopwatch at different pressures to mesuare the delay times. I concluded that high air pressure does slow radio waves, but not with a significant difference.

**Project Number:** MPH070

**Grade:** 8

**Title:** Don't Slip!

**Abstract:** When my grandmother moved into assisted living I noticed that all the floors were carpeted. I wondered if certain types of flooring have more friction than others. I experimented on different flooring samples; tile, carpet and wood. The tile had the least amount of friction, but absorbed 10 out of the 30 mL. This was because I didn't use mortar and the water seeped through the cracks. The wood had the second most friction, but no absorbency. Carpet, having rough, wool fibers, had the most friction and absorption. I hope to help people with my experiment.

**Project Number:** MPH071

**Grade:** 8

**Title:** Arrow Pannetration

**Abstract:** Which types of different arrow tips penetrate the deepest in a Styrofoam target? Shoot each type of tip into a foam target using a composite bow. Then complete the procedure again for consistency. Measure the penetration. The broad head went the deepest into the Styrofoam target.

**Project Number:** MPH072

**Grade:** 8

## INTERMEDIATE DIVISION – PHYSICS

**Title:** Forensic Science

**Abstract:** I chose this project because I wanted to learn about forensic science and how crimes are solved. In this project I hope to find that the range of the spatter will increase as height increases. A balloon filled with 210 milliliters of water will be dropped from four different heights. Then I will measure the spatter that it makes. I found that the higher the distance from the ground the balloon is that i drop, the wider the range of spatter is in my trials.

**Project Number:** MPH073

**Grade:** 8

**Title:** How strong is an egg

**Abstract:** The purpose of this project is to see if the egg is stronger horizontally or vertically. To see how strong it is you need two eggs, a piece of clay, two equal stacks of quarters, wax paper, and a few books. To test the experiment you make an open circle with the clay then put the egg either vertically or horizontally, after that put the quarters across from each other. Start staking books on top the egg and quarters until the egg breaks. My conclusion was that the egg is stronger when it's horizontally.

**Project Number:** MPH074

**Grade:** 7

**Title:** Calculating the Force of Friction in Various Vehicles

**Abstract:** Six types of vehicles will be found, Focus, Taurus Wagon, F150, Acura MDX, Lexus ES300, and a Dodge Van to test the force of friction. The vehicles will reach a speed of 16.1 kmph before switching into neutral and coasting to a stop. The distance from where the vehicle switched into neutral to where it stopped will be measured with a trundle wheel. When the vehicle is traveling, a stopwatch will be used to time the vehicle from where it switched into neutral and coast to a stop. Verneir software will be used to calculate the force of friction.

**Project Number:** MPH075

**Grade:** 8

**Title:** Insulation Proclamation

**Abstract:** In order to begin my experiment, it will be to construct a wooden box measuring 40.6 cm by 40.6 cm on all sides. One side of the box will be left open with a 5.1 cm by 10.2 cm board nailed onto each side of the opening. This space will hold the insulation in place during testing.

**Project Number:** MPH076

**Grade:** 8

**Title:** Trajectory of Modified Baseballs

**Abstract:** An illegally modified baseball is a pitch in which the pitcher applies an illegal substance to the baseball, either to change its aerodynamic properties or to reduce friction between his fingers and the ball. This experiment intended to learn which illegally modified baseball would have the greatest change in trajectory. In this experiment, 4 illegal substances, saliva, petroleum jelly, mud, and pine tar, were applied to baseballs and thrown by a pitching machine 10 times for each substance. These pitches were compared to the pitch with nothing on the baseball. It was determined that mud had the greatest change in trajectory.

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**Project Number:** MPH077

**Grade:** 8

**Title:** Co2 Release

**Abstract:** What common co2 product will release gas the quickest? I ground up four different products that fizz under water. I clipped them with a paper clip on the bottom of a fish tank and set a timer. I wanted to see how long it would take for a bottle to rise from the released co2. The immunity suppliment tablets did the best.

**Project Number:** MPH078

**Grade:** 7

**Title:** Atomic Spectra of the Sun

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

**Project Number:** MPH079

**Grade:** 7

**Title:** The Efficiency of Cooling Methods

**Abstract:** The purpose of this investigation is to determine which cooling method is most efficient. If ice cubes, ice chips, half-moon chips, ice water bath, or slurry are used to cool soda, then the ice water bath has better convection properties by eliminating air. In this investigation different types of ice cubes, and ice slurry were used to see thich one cooled the temperature of the soda the fastest. The decrease and temperature has measured in 30 minutes. The ice slurry cooled the soda the fastest followed by half-moon chips, ice water bath, ice chips, and ice cubes. The ice water slurry cooled the soda the fastest because there was less reduced amount of air.

**Project Number:** MPH080

**Grade:** 7

**Title:** Faraday's Law of Induction

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

**Project Number:** MPH081

**Grade:** 7

**Title:** Electromagnets

**Abstract:** The purpose of my experiment was to see whether the type/number of batteries make a electromagnet more powerful. My hypothesis was that the magnet using 8 lithium batteries would be the strongest, because lithium is a potent material, and because 8 batteries can add up the voltage. The outcome of my experiment was that the average of the 1-batteried magnet with lithium picked up 17.1 paperclips, the 1-batteried magnet with alkaline had a average of 19.3 paperclips. The one with 2 batteries of lithium had a average of 21 clips, and the one with alkaline had 22 clips. The 4 batteried lithium magnet had 26.3, then alkaline had 24. Finally, the 8 batteried magnet with lithium had 27.7 clips, and alkaline had 24.3 clips. As a conclusion, my hypothesis was supported because the magnet with 8 lithium batteries had picked up an average of the most, being 27.7.

**Project Number:** MPH083

**Grade:** 7

**Title:** Buoyancy

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**Abstract:** The purpose of this experiment is to find out if salt water can float objects better than tap water and how the objects' volume are related to the buoyancy force they received. From my research, I hypothesized that 1) water with higher density can float things better and 2) the bigger the object volume is, the higher the buoyancy force it receives. Based on these results my hypothesis was supported because these are in agreement with Archimede's principle.

**Project Number:** MPH084

**Grade:** 8

**Title:** Aerodynamics

**Abstract:** This experiment explored different speed to lift relationships in different types of airplanes. The procedure included using the Flight Simulator X computer program and a stopwatch to measure take-off time. Several different types of airplanes were tested. Quantitative Data collected included the speed of the plane and take-off time. The data showed that there was a difference between plane types. Airplanes with bigger wings had a longer take-off time than airplanes with smaller wings.

**Project Number:** MPH085

**Grade:** 8

**Title:** Insulate Smart Now - Pay Less Later

**Abstract:** The purpose of my experiment was to discover which insulation is most suitable for a 2500 sq ft house in the Pittsburgh area, as well as whether if people were informed on insulation if they would decide differently on the insulation used in their homes. My problem was: "What is the best insulation for a basic home in the Pittsburgh area in terms of energy loss, cost, and carbon footprint? Does people's lack of knowledge on insulation prevent them from choosing a more beneficial insulation for their home?" My hypothesis was that, "I believe Spray Foam insulation offers the best heat resistance and air leakage reduction properties in new homes. I also predict that in most cases if people are informed about insulation they would choose the ones that perform better and save energy in the long run."

**Project Number:** MPH086

**Grade:** 8

**Title:** The Effect of Temperature on Magnets

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

**Project Number:** MPH087

**Grade:** 8

**Title:** Weight Lifting It's Electrifying!!!

**Abstract:** I made an electromagnet. Then, I ran different amounts of current through it and recorded the amount of weight it picked up.

**Project Number:** MPH088

**Grade:** 8

**Title:** Considering Candles

**Abstract:** Candles are a huge industry in the world today. Everyone wants a candle with a calming scent, long burn time, and elegant style. Does the color of the candle affect the burn

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time of that candle? Can a consumer looking only for burn time buy a certain color, guaranteeing that it will burn the longest? I sought to figure this out in my project.

**Project Number:** MPH089

**Grade:** 8

**Title:** Do Movie Preview Preview Hearing Loss

**Abstract:** In my project we tested if movie previews were loud enough to give hearing loss. We used a decimeter to test the average of the sound in dBs. We also found peak levels. We went to different movie theaters along with all the different movie ratings to see if movie previews could cause hearing loss.

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**Project Number:** MTM001

**Grade:** 7

**Title:** Diet Density

**Abstract:** In our project we based it on finding out why diet pop floats. First, we put Pepsi and diet Pepsi in a fish aquarium filled with water. Once it was proven to float we looked over our theories. Next we looked up the ingredients in each, what the ingredients do, and mostly information of aspartame. When the project was done we discovered that diet pop floats because there is a tiny bit of carbon dioxide at the top of each can but because of the excessive amount of sugar in the regular pop it sinks.

**Project Number:** MTM002

**Grade:** 8

**Title:** Doctor, Doctor! What Time Is It?

**Abstract:** Circadian rhythm is a biological clock. There are many parts of circadian rhythm; body temperature and reaction time are believed to be two aspects. For our project, we wanted to see the pattern of body temperature and reaction time throughout the day. Every three hours, we took our body temperature and did a reaction time test online. After analyzing the results, we came to our conclusion that there is a slight pattern in both a human's body temperature and reaction time.

**Project Number:** MTM003

**Grade:** 7

**Title:** Food Dye DNA Migration

**Abstract:** In our experiment, we tested how far food dye DNA molecules would migrate. To do this, we built a gel electrophoresis chamber and filled it with agarose. We made small wells in the agarose and inside of the wells, we put in a drop of food dye. Then we connected a negative and positive electrode to each side of the chamber. After that, we waited as the electric current forced the molecules to migrate. Last, we measured how far each one migrated. We concluded that the lighter colors migrated farther, while the combined and darker colors traveled less.

**Project Number:** MTM003

**Grade:** 7

**Title:** Food Dye DNA Migration

**Abstract:** In our experiment, we tested how far food dye DNA molecules would migrate. To do this, we built a gel electrophoresis chamber and filled it with agarose. We made small wells in the agarose and inside of the wells, we put in a drop of food dye. Then we connected a negative and positive electrode to each side of the chamber. After that, we waited as the electric current forced the molecules to migrate. Last, we measured how far each one migrated. We concluded that the lighter colors migrated farther, while the combined and darker colors traveled less.

**Project Number:** MTM004

**Grade:** 8

**Title:** Full of Liquid - Still Dehydrated!

**Abstract:** Our project is going to be about dehydration. We will be conducting our project with two different types of tests. The first test will be with liquids we will be using eight different types of beverages. We will then put a spider plant in the beverages. When the project ends

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we will then see which water keep the plant hydrated the best. We are predicting our come will be Aquarius red water for the spider plant. Our second experiment is about rehydration. We will use three different types of dried fruits. We will use cherries, cranberries, and raisins. We will then put them into eight different beverages. We are predicting for the fruit experiment that Aquarius blue will work the best.

**Project Number:** MTM005

**Grade:** 8

**Title:** Hover Craft Design

**Abstract:** For our science fair project we made miniature hover crafts in different shapes and tested them to see what the best shape works best. We found out that the rectangle is the best shape. We got this idea from the movie Back To The Future because we wanted to ride down the street on a hover board. We wanted to be able to tell other kids that we have a hover board, and we did. We made a full scale hover board, but sadly it could only lift a small five year old. We feel our hover board was a success even though we did not get to ride it.

**Project Number:** MTM006

**Grade:** 7

**Title:** How Batteries Affect Plant Growth

**Abstract:** The purpose of our experiment was to test if batteries would affect the growth of plants. First, we planted grass seed. Then we placed eroded batteries in the water the plants drank. Our hypothesis was that plants would grow better without batteries. Amazingly, our results proved that we were wrong. After 4 weeks, the results showed they grew better than the control group.

**Project Number:** MTM007

**Grade:** 8

**Title:** Quest for Metal

**Abstract:** Miners cannot go around the world mining for specific minerals without knowing that they are present for sure. So, after a study on magnets and their fields, we came to a speculation that we could use aeromagnetic survey to find/assure the presence of various minerals in the earth. To understand how and what aeromagnetic survey is, we built a simple model of this technique. It contained an aircraft, and a magnet suspended from it; terrain also contains magnets. We assume that whenever the magnet suspended from the aircraft is over the magnetic field in the Earth, it will indicate the presence of magnetic field in the earth. After studying this model, we came to a conclusion that Aeromagnetic survey is a geophysical survey carried out using a magnet or a magnetometer aboard or towed behind an aircraft; we also thought that a magnet's field can be recorded even when enclosed in any medium. Using these and other principles, we came up with possible developments in the future.

**Project Number:** MTM008

**Grade:** 8

**Title:** R Kids Affected by TV Characters?

**Abstract:** We went to Franklin Elementary School and brought our items for the students to choose from. We gave them a choice between cartoon characters and political party members. We went by grade to help see how the results changed as the students became more mature. We then recorded the results and turned them into charts and graphs. In conclusion, we feel that students are affected less as they mature

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**Project Number:** MTM009

**Grade:** 8

**Title:** Rip off pop!

**Abstract:** Please visit students' exhibit for the abstract.

**Project Number:** MTM010

**Grade:** 7

**Title:** Soda Carbonation

**Abstract:** The purpose of this experiment is to find out the temperature at which the soda will keep its carbonation. The procedure will be to keep one bottle of soda at room temperature and to refrigerate the other. We will test for carbonation at specific time periods.

**Project Number:** MTM011

**Grade:** 7

**Title:** Sodium Chloride and Frozen H<sub>2</sub>O

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

**Project Number:** MTM012

**Grade:** 8

**Title:** Strength of Bridge Designs

**Abstract:** Spurred by the recent collapse of the I-35 bridge in Minneapolis, our team chose to compare the structural integrity of several common bridge designs. Our plan was to construct three miniature bridges of similar building materials and load the deck structure until failure. We found that the simple I-beam bridge design supported the highest dead load. This design is currently used in many Western Pennsylvania bridges, which may support why this design is popular with PennDOT engineers. Further work is planned to see if the mode of failure is based on the materials used in the bridge.

**Project Number:** MTM013

**Grade:** 8

**Title:** The Great Memory Debate

**Abstract:** We tested 45 different people on their short-term memory in order to find out how the majority memorized best of three different methods: visual, oral, and aural. We gave each person three minutes to memorize the lists, the first time silently to themselves, the second aloud, and the final time being read to by one of the testers. We found that most of the participants memorized the information best orally, meaning that was their highest score, while visual was the method least effective. We can conclude that an oral method of learning was by far the most effective method of the three.

**Project Number:** MTM014

**Grade:** 8

**Title:** The Life of a Flower

**Abstract:** The purpose of life a flower is so people can know what to give there plants to help them live longer. Also so people don't have to constantly buy new flowers or go pick new

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flowers every few days. First we got are materials then we put flowers in cups and labeled the cups we watched each day and wrote down what happened next we organized are information. Are data is what happened day by day. In conclusion we found out that a little bit of soap in the bottom of the cup kept the flower the healthiest longest.

**Project Number:** MTM015

**Grade:** 7

**Title:** The Power of Heat Right Under Your FT!

**Abstract:** Geothermal Energy is a renewable energy resource that helps in many ways. It can be used over and over again. The process of geothermal energy is like a cycle, the steam that spins the turbines to create electricity goes to a condenser which then turns into water and then sends it back into the reservoir for reuse. If we start using renewable energy resources from now on we won't have to make a drastic change when there are no more fossil fuels left in the world. Geothermal Energy is a really useful type of renewable energy resources.

**Project Number:** MTM016

**Grade:** 7

**Title:** The Sweet Depression

**Abstract:** We then researched freezing point depression to figure out what kind of salt to use. After analyzing our data we decided to use Road salt ( $\text{CaCl}_2$ ). The second part of our experiment dealt with freezing temperature after the salt melted the ice in our ice cream making. We tasted each kind and tested the texture and recorded our observations. We learned that road salt ( $\text{CaCl}_2$ ) lowers the freezing point to make the milk freeze to become ice cream. We recorded our data into a table and made graphs. The road salt lowers the freezing point more than the table salt.