



# 66th PITTSBURGH REGIONAL SCIENCE & ENGINEERING FAIR

## JUNIOR DIVISION ABSTRACTS

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

## TABLE OF CONTENTS

|                        | <b>PAGE</b> |
|------------------------|-------------|
| <b>JUNIOR DIVISION</b> |             |
| PHYSICAL SCIENCE.....  | 1           |
| LIFE SCIENCE.....      | 13          |
| CONSUMER SCIENCE.....  | 24          |

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS002

Grade: 6

Title: Which Metals Rust Fastest in Water?

Abstract: The purpose of the experiment was to see which metal would rust faster in water. I took the three of each nail and tied a string around the tip. Next, I put 6 oz. of water into each cup.. The first section had the three different nails fully in the water. The second section nails were half way in the water. The third section nails were not touching the water. My conclusions from this experiment were that the copper rusted more than the aluminum in the water. The aluminum didn't rust as much because of the iron oxide formation

Project Number: JPS003

Grade: 6

Title: Electromagnetism

Abstract: Objective: In an Electromagnet, would increasing the voltage, increasing the number of coils, or increasing the thickness of the coil increase its electromagnetic attraction. Procedure: Three electromagnets were made with 26-gauge wire (100, 200, and 300 coils each). Two electromagnets were made with 200 coils each, using 22 and 30-gauge. The distance of attraction of paper clips measured the magnetic attraction. Conclusion: "Increasing the voltage and increasing the number of coils in an electromagnet increased the power of the electromagnet". However, "increasing the thickness of the coil did not change the power of the electromagnet".

Project Number: JPS004

Grade: 6

Title: That's the Way the Ball Bounces

Abstract: Golfers believe that the distance that their ball travels depends only on how hard it is hit. This experiment was done to determine whether the bounciness of a golf ball has any influence on how far it travels. Six golf balls were measured to see how high and how far they could go. After recording all of the results, the conclusion was that the golf ball that bounces the highest does not travel the furthest. Future experimentation could determine what other factors could affect the distance.

Project Number: JPS005

Grade: 6

Title: Strength of Electromagnets

Abstract: Electromagnets are magnets powered by electricity. This project is to find out if the more wire wraps you put on a bar the stronger the magnet will become. There were three bars used. The first bar had 50 wraps, the second had 75 wraps and the third had 100 wraps. The bar with 100 wraps picked up 98.0 grains of iron filling. I found out that the more wire wraps on the bar, the better a conductor I had which gives it more power.

Project Number: JPS006

Grade: 6

Title: The Water We Drink

Abstract: All life on earth depends on clean water to survive. I wanted to find out how clean our drinking water is and whether the pollutants or chemicals would vary depending on location. I tested drinking water samples from various places in Pennsylvania and Ohio including tap and well water, for eleven pollutants and chemicals. Because many factors impact water quality, I would like to test ground water samples from those same areas and compare those same locations with my findings.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS007

Grade: 6

Title: Hot Rods

Abstract: My science fair project is "Which metals conduct heat the best?" My hypothesis was based on information that I researched when I decided on my topic. I thought that copper would conduct heat the best out of four types of metals I used in the experiment. I cut each metal rod the same length and used a ball of wax and a candle to measure how long it would take the wax to melt. After completing three trials, I found that the carbon steel and the copper were rather close, but the copper had a better time by about 10 seconds. The inconel (which is discussed in the research part of my project) took about 255 seconds to melt the wax. If I would do this experiment again, I would use some different metals.

Project Number: JPS008

Grade: 6

Title: Pump Me Up

Abstract: I started my experiment with the question about whether a soccer ball will travel further if it is over inflated or under inflated. My hypothesis was that I thought that the over inflated ball would travel further than the under inflated ball. To do this experiment I had to build an apparatus which would simulate a foot kicking a ball. Once the apparatus was constructed and tested, I was able to begin the actual testing procedure. I used three new soccer balls- one being inflated to the suggested pressure. I repeated my procedure three times to be certain that the data would be consistent. The results of the trials can be seen in the data section of my project. One interesting fact that I never realized was that if sports did not regulate the amount of air pressure in the ball, then winning would be based on the amount of air in a ball and not the skills of the players.

Project Number: JPS009

Grade: 6

Title: Which Photo Album Works The Best?

Abstract: Many different types of photo albums are used for displaying and archiving photographs. This project was intended to evaluate which photo album preserves photographs the best. Two different photos were mounted in pages of magnetic, plastic-sleeved, and Creative Memories photo albums. Each album page was subjected to single variables of heat, light, and moisture, and then visually inspected for damage. It was determined that none of the photographs were visually affected. The moisture exposed magnetic and Creative Memories paper album pages were damaged. Future experiments are planned to conduct a repeat of this experiment, over a longer period of time.

Project Number: JPS010

Grade: 6

Title: Friction Freeway

Abstract: How fast will marbles go down a track at different heights, surfaces, and marbles? I wanted know how different surfaces effect movement. The procedures I used were; get all the materials, then testing on each level and record them. I concluded that sandpaper slowed it down but everything else had very little effect on it. If it has free rotation, it does not matter the size, weight or what made of in compared to the material it is being dragged upon.

Project Number: JPS011

Grade: 6

Title: What Metal Is Strongest Under Heat?

Abstract: In my project I tested metal to see which was strongest under heat. I wanted to see if we could construct buildings with a metal stronger than mild steel. I did my project by gathering

## JUNIOR DIVISION - PHYSICAL SCIENCE

the metals and the torch. Next, I used a machine that puts pressure on the object and measures how much pressure it is putting on the object. Metal rods were tested cold and hot to see how the metal reacted under pressure, the data was recorded. I found out that stainless steel was strongest, plated steel, mild steel, brass, and aluminum finished in that order.

Project Number: JPS012

Grade: 6

Title: What is the Best Temperature to Raise Frozen Bread Dough?

Abstract: The purpose of my experiment is to find out what the best temperature to raise frozen bread dough is. Buy 3 loaves frozen bread dough, put one in 33 fridge for 18 hours. Take loaf out, put in 65° room. When rises to top of bread pan, take out and bake 20 minutes at 275°. Record how long it took to rise. Do the same thing you did with first loaf, with other two loaves, put one in 70° room, and one in 75° room. Don't forget to keep log book. After my experiment was done, I noticed there is a very large difference in temperature you raise your bread dough in. Frozen bread dough will rise quicker in warmer areas.

Project Number: JPS013

Grade: 6

Title: Floating Fruits and Vegetables

Abstract: Cruise ships, fraters, and speed boats are always setting sail in the ocean day and night. I started to wonder how boats float in the water, especially after I went on a cruise ship in Hawaii. Since I couldn't get a big ship in my house I used fruits and vegetables. It seemed to work out fine even with the different the different shapes. I did this project to find out why and how things float and sink from different shapes and sizes.

Project Number: JPS014

Grade: 6

Title: Rainbow Connection

Abstract: My project was the creation of a rainbow using different techniques of light refraction. The first technique I used was to allow light to pass through a prism. The light was separated into the spectrum (rainbow). The second technique I explored was allowing sunlight to pass through water and strike a mirror which reflected the spectrum. The third technique I used was to blow bubbles and observe the spectrum created o the surface of the bubbles. The fourth technique was to spray a fine mist of water and allow sunlight to shine through it. Refraction is the process of bending light.

Project Number: JPS015

Grade: 6

Title: Producing and Testing CO<sub>2</sub>

Abstract: The purpose of my experiment is to produce and test for carbon dioxide. Baking soda and vinegar were used to make the carbon dioxide gas. I hypothesized that by increasing the amount of baking soda used, a large difference would be made in the production of carbon dioxide.

Project Number: JPS016

Grade: 6

Title: Surface Area and Electromagnetism

Abstract: This project determined the relationship between surface area and the amount of mass an electromagnet can lift. The first two experiments failed so procedures were modified. In the successful experiment, current was varied by changing the number of batteries. The relationship between mass (number of pennies) lifted and current was linear for the rounded surface area

## JUNIOR DIVISION - PHYSICAL SCIENCE

(paper clip head) and was related to current squared for the flat surface area (nail head). And for the rounded surface area, there was a "tearing effect" beyond which more current failed to lift more mass.

Project Number: JPS017

Grade: 6

Title: Bubbly Business

Abstract: When you're washing dishes and doing laundry you are working with bubbles. This project was to find out if more bubbles were created with laundry or dishwashing detergents. Two tablespoons of each of four detergents were set into buckets, water was added, and the buckets shaken to create bubbles. I came back to measure the height of the bubbles every 13 minutes. Each time the laundry detergents made more bubbles. Research states that phosphates, which are minerals, used in cleaning products do not make bubbles. The dishwashing detergents had phosphates. Future work is to determine if detergents with phosphates clean better than ones without phosphates.

Project Number: JPS018

Grade: 6

Title: Conquering The Loop-The-Loop

Abstract: Have you ever seen a roller coaster go through a loop-the-loop? Tests were done to find the minimum starting height of an object to go down a model racecar track and go through an overhead loop. One reference said that the theoretical height is  $1 \frac{1}{4}$  times the height of the loop diameter. Various objects were used including marbles, model cars, and wheels. The results showed that the experimental height was higher than the theoretical. This could be due to more friction or track problems. Someone could do further testing using more, or different objects.

Project Number: JPS019

Grade: 6

Title: Good to the Last Drop

Abstract: The purpose of this experiment was to see if the temperature of brewing water affects the taste of the coffee. Coffee was made using hot water, room temperature water, and ice cold water. Different taste testers then tasted the coffee. The taste testers discovered that coffee made with ice cold water is more bitter than coffee made with water of other temperatures. In conclusion the temperature of brewing water affects the taste of the coffee.

Project Number: JPS020

Grade: 6

Title: Battle of the Bubble

Abstract: My experiment is testing four kinds of bubble gum. Two brands of gum contained sugar and two did not contain sugar. They were compared to each other to see which would blow the largest bubble without popping.

Project Number: JPS021

Grade: 6

Title: What Is The Best Insulator?

Abstract: Imagine you are out in the cold! Ten minutes later, you are freezing because you are not warm enough. I have researched and tested a way to tell if you are dressing warm enough. Through the use of water in a glass that is placed into a freezer with the material that you would dress in. Time how long it takes from  $99^{\circ}\text{F}$  to  $85^{\circ}\text{F}$ . If the time that it takes to get from  $99^{\circ}\text{F}$  to  $85^{\circ}\text{F}$  is less than 10 minutes then the material that was used is not a good insulator. Change this experiment by heating it.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS022

Grade: 6

Title: Nuclear Energy

Abstract: My science fair project is on nuclear power plants. My purpose for doing this science fair project on nuclear power plants is because I wanted to know how they make energy. Nuclear power plants use the fission process to generate heat which then turns into steam in the steam generator. The steam then spins a turbine which generates electricity. Other key factors come into play in making electricity as well, such as the control rods, cooling towers, fuel rods, and the reactor.

Project Number: JPS023

Grade: 6

Title: EMF Strength versus Distance

Abstract: The purpose of this project was to determine what kind of relationship, if any, exists between electromagnetic field strength and distance for various household appliances. With power consumption held constant, a milligauss meter was used to measure EMF strength at several distances from the source. I found that the relationship between EMF strength and distance is an exponential function that varies in magnitude for each device. Furthermore, I found that the exponential function changes at a certain distance from the source; therefore, two exponential functions are required to describe the relationship. For each equation, I obtained R-squared values of 0.97 to 1.

Project Number: JPS024

Grade: 6

Title: Choosing the Best Deicer

Abstract: I did my experiment because I wanted to know which road deicer to use on sidewalks when it gets icy. I tested my experiment by putting the same volume or penny amount in the Petri dishes. After every time point of fifteen minutes, I drew the melted liquid off of the Petri dishes and recorded the data in mL in my logbook. I did three trials for each different experiment I tested. My results are that calcium chloride is the deicer that is most efficient for each experiment I tested. In conclusion, calcium chloride is the best deicer to use.

Project Number: JPS025

Grade: 6

Title: Stones...Hard, Soft, or Porous?

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

Project Number: JPS026

Grade: 6

Title: Do Crystals Have Different Shapes

Abstract: Crystals are very useful objects, but I did not know much about them. My project was meant to see if crystals had the same shape or not. My research indicated that they would have different shapes, but I needed to be sure. I grew sugar and salt crystals to see what shapes I could grow. The project showed that crystals do have different shapes.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS027

Grade: 6

Title: Are Our Local Waters Acidic?

Abstract: Did you ever wonder if your town's or city's water had acid in them? Spring, river, lake, and rain water in your area are probably acidic usually caused by acid rain. Acid rain occurs when sulfuric and nitric acids in the air are hit by rain which turns into acid rain. Tap water was once river water, but they raise the pH level to make it safe to drink. Spring water, however, is protected until it comes out of the hillside so its pH is not affected by rain. If you want to see if your water is acidic, take water samples and measure the pH and see how much acid you have in your water.

Project Number: JPS028

Grade: 6

Title: Does the Temperature of a Basketball effect how High it Bounces?

Abstract: The purpose of this experiment was to find out if a basket would become higher weather it was hot, room temperature, or cold. After my experiment I learned that the result of the hot basketball was the best because it bounced the highest. The frozen was the worst because it was frozen and did not bounce good. The room temperature ball was in between. My hypothesis was correct. I also dropped the ball at the same place every time to get better results.

Project Number: JPS029

Grade: 6

Title: Which Insulations works the best?

Abstract: The purpose: to see how much heat the houses with the different insulations lose in five minutes. Hypothesis: pink fiberglass houses will lose the least heat in five minutes compared to other insulators because it is a real insulation that most people use in their attics to keep their houses warm. The control group house lost 14 degrees Fahrenheit. The cotton insulated house lost 17 degrees. The pink fiberglass house lost 13 degrees. The fiberglass insulated house lost the least heat, it only decreased by 13 degrees

Project Number: JPS030

Grade: 6

Title: What Material Makes a Parachute Fall the Slowest

Abstract: My experiment is what material makes a parachute fall the slowest. My purpose is to learn about the flight of parachutes. The procedure for my experiment is to make 6 parachutes from different materials. The parachutes are attached to a weight and then dropped from a fixed height in a controlled launch area. The flight of the parachutes are then timed with a stopwatch. Three trials were performed with each parachute. The data was then recorded and analyzed. Of the six materials, plastic was the one with the highest mean time of 5.31 seconds. Metallic/nylon had the next highest mean time of 3.45 seconds. The next highest, with a mean time of 3.40 seconds, was nylon/polyester. Heavy nylon had a mean time of 3.02 seconds and was fourth highest. The fifth highest mean time was rayon/polyester with 2.98 seconds. Vinyl, the fastest one to fall, had a mean time of 2.37 seconds. My hypothesis was that the lighter materials would fall slower than the heavier materials. My hypothesis was only partially correct. The data showed that the lighter materials fell slower than the heavier ones, but weight isn't the only factor affecting the fall of a parachute. I realized that density of a material is also important. It appears that the lighter weight is more resistant to gravity, but the density of the material enables the parachute to inflate better. In conclusion, I believe now that the best parachute material will combine a light weight with a thick density.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS031

Grade: 6

Title: Columns

Abstract: Ancient Egyptians, Greeks, and Romans used columns for building temples and important public buildings. They also built and dedicated them to their gods/goddesses and made them the homes for kings and queens. The Egyptians, Greeks, and Romans realized that instead of being plain and circular, they could make them decorative and use different shapes. You can find columns at museums, theaters, and many other public places. Columns can support a certain amount of weight based on its length and diameter. Not only are columns creative and beautiful, they are strong and durable. There are still ancient buildings that exist today such as the Parthenon and the Coliseum in Rome.

Project Number: JPS032

Grade: 6

Title: Which Bridge Holds The Most Weight?

Abstract: Bridges are such an interesting engineering structure. The purpose for completing this project was to determine which type of bridge structure would hold the most weight. I wanted to understand how a bridge can stay suspended and at the same time hold weight. From completing this project, I want to be able to reassure people that bridges are very stable.

Project Number: JPS033

Grade: 6

Title: Which Paper towel Absorbs more Water?

Abstract: The purpose: to determine if the price of a paper towel is related to its absorbency. Hypothesis: the more expensive a paper towel is, the more absorbent it will be. I poured 1 tablespoon of water over each paper towel and held them over the plastic to catch any un-absorbed water. Viva held 3.5 tsp, So-Dri, 3 tsp, Brawny, 2.5 tsp, Giant Eagle, 2 tsp, and Bounty, 2 tsp. After comparing them with amount absorbed and then to price per roll, I found that my hypothesis was incorrect. The most expensive did absorb the most, but then the least expensive came in second.

Project Number: JPS034

Grade: 6

Title: Which Fishing Line will hold its Strength?

Abstract: To test the weight limits of three different fishing lines. I took the fishing line and tied one end to the white pipe and the other end to the plastic bag, which is holding one 2 liter of pop bottle. Pull up on the white pipe trying to get the pop bottle off the ground. Data: Stren 1 held its limit of 2-4 pounds, Stren 2 held its limit of 7-8 pounds. Eagle Claw held its limit of 11 pounds. I would recommend the all because they all hold there weight

Project Number: JPS035

Grade: 6

Title: Is There Air In Soap?

Abstract: The purpose for completing this project was to determine if soap actually had air in it. Using five different types of soaps, I hypothesized that Ivory soap would have air in it because it floats on top of water and Dial soap would contain no air because it sinks immediately.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS036

Grade: 6

Title: How High How Low

Abstract: My friend likes to play tennis and wanted to know if temperature has an effect on the performance of the ball. My question then was what will the different conditions contribute to the performance of the bounce of the tennis ball? I thought that the heated tennis ball would bounce the highest. The first step to my procedure was to gather all materials and prepare the testing site. Next, I placed one of the tennis balls in the freezer along with a thermometer and a second ball in a heating pad along with another thermometer. The third ball was kept at room temperature. My data shows temperatures that each ball was tested. I repeated a bounce three times to verify that my experiment was valid.

Project Number: JPS037

Grade: 6

Title: What is in the Water?

Abstract: Have you ever wondered what is in the water you drink? Tests were conducted on four one-ounce samples of home tap water, school fountain water, home refrigerator filtered water, and melted snow. Test strips were used to check for pH, hardness, copper content and chlorine content. Test results proved that tap water had the highest pH and the highest chlorine content and school fountain water was the hardest and had the highest copper content. Further testing could be performed on different water sources and at different times of the year to find out what is in the water we drink.

Project Number: JPS038

Grade: 6

Title: Using Your Noodle!

Abstract: The purpose for completing this project was to settle my curiosity as to why structures, lighter than us, can hold a significant amount of weight. I wanted to understand better the idea of structural engineering and how structures can be built to hold this amount of weight.

Project Number: JPS039

Grade: 6

Title: The Comparison of the Evaporation Rate of Water

Abstract: The rate of evaporation is not the same in all liquids. This work intended to learn if water had a faster evaporation rate than other liquids. 10ML each of water, Pepsi, apple juice, and orange juice were placed in graduated cylinders and the amount of evaporation of each was recorded every day. It was found that evaporation of any of the liquids was very slow. After thirty days apple juice had evaporated the most, but only by a total of 1.3ML. This experiment was conducted during the winter and humidity was consistently high and temperatures were low throughout the entire experiment. These factors could have had an effect on the results. Future work is planned to run the same experiment during the summer months.

Project Number: JPS040

Grade: 6

Title: ASA Please

Abstract: Willow bark yields a chemical that human bodies convert to as salicylate. Aspirin belongs to this group. Aspirin ( Acetyl Salicylic Acid ), one of the most commonly used drugs in the world, has been manufactured in laboratories since the 1800's. This project intended to learn if brand-named and generic aspirins dissolve at equal rates. One brand-named aspirin was compared with three generic aspirins. They were dissolved in water baking soda solution, and

## JUNIOR DIVISION - PHYSICAL SCIENCE

lemon juice. Their dissolving rates were recorded. Brand-named aspirin was determined to dissolve fastest. Brand-named aspirin could be the choice if time is essential.

Project Number: JPS041

Grade: 6

Title: 60 Watt Light Bulb Project

Abstract: My experiment was the 60 watt incandescent light bulb project. I wanted to understand the difference between the brands of 60 watt light bulbs and the amount of light each gave off. With a photo diode and voltmeter, I was able to measure the amount of light the different brands of light bulbs gave off. The results showed the different brands of 60 watt bulbs did not give off the same amount of light. I also learned the difference between watts and lumens and can see how this could have an effect on how our country can use less energy.

Project Number: JPS042

Grade: 6

Title: Balloon Rocket Design

Abstract: I always have been fascinated of how a rocket is propelled into outer space and the amount of force needed to boost in into space. The purpose for completing this project was to determine how far a balloon will travel using three index cards with three different sized holes. I wanted this project to show that a rocket will travel farther with a greater force and less with a smaller force.

Project Number: JPS043

Grade: 6

Title: What Temperature of Water will Freeze the Fastest?

Abstract: My purpose is to find out which of four waters will freeze the fastest- 50 degrees, 60 degrees, 80 degrees, and 100 degrees. The process I used is as follows: Take four ice cube trays and mark one A, B, C, and D. Then fill tray A with 50 degrees of water, tray B with 60 degrees water, fill tray C with 80 Degrees of water, and fill tray D with 100 degrees of water; Finally put all four trays in a freezer and check them every 20 minutes, do this until all the trays have frozen. Record the temperatures and textures in your logbook. For best results repeat this experiment three more times. In the first trail the 100 degrees froze first and the 60 degrees water froze last, in the second trail the 50 degree water froze first and the 100 degrees froze last, and in the last two trails the 50 degrees froze first and the 100 degrees froze last. In conclusion my hypothesis was right the majority of the waters that froze first were the colder waters, and basically everything worked out as I planned it to.

Project Number: JPS044

Grade: 6

Title: Rust Formation on Wax Coated Metal

Abstract: Rust is your automobile's worst enemy. My experiment was to learn if the formation of rust could be slowed down when metal is covered with wax. Four metal samples were sprayed with water and saltwater. Two of the samples were coated with wax. I sprayed the samples and allowed them to dry overnight. I photographed the samples each day and I could see the rust formed slower on the wax coated samples. The metal I sprayed with saltwater corroded more quickly than the plain water. It could be seen that the wax slowed down the rusting.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS045

Grade: 6

Title: Opposites Attract

Abstract: The purpose of my experiment was to find out why static electricity shocks us. Is it the type of material we wear that affects the amount of static electricity? My hypothesis was that wool material would shock us more because we wear wool in the cold weather and are affected by static mostly at this time of the year. I used silk, wool, and nylon and a balloon to conduct this experiment. I rubbed the balloon on each material and timed how long the balloon stayed on the wall. After three trials, I found that the nylon worked the best. I concluded that nylon worked the best, proving my hypothesis wrong. If I would decide to do this experiment again, I would perform the procedure during different times of the year to see if the seasonal climates had any relevance.

Project Number: JPS046

Grade: 6

Title: Cleaning Up Spills

Abstract: Have you ever heard on the news about oil spills? These spills are extremely hazardous. While an effective method for cleaning these spills is still elusive, I tried to help by creating this experiment. Four different methods were tried: scooping the oil out of the water, adding gravel then removing it to catch the oil, soaking up the oil with cloth, and adding soap. While the soap test could not be considered accurate, it removed the most: 0.09 kilograms. The other three removed 0.04 kilograms. One thing I would do differently would be to try a new method for the soap test.

Project Number: JPS047

Grade: 6

Title: Insulation and Its Effectiveness

Abstract: Insulation is used in almost every home. This work was intended to see which insulators work best. Four insulators and a control had a light shone on each of them and the inside temperature was subtracted from the outside temperature. Fiberglass proved to be the best insulator. If anyone were to buy insulation, they should buy fiberglass. Further investigation will be conducted to determine the most cost-effective method of insulation.

Project Number: JPS048

Grade: 6

Title: The Effect of Football on Distance

Abstract: Footballs come in many sizes and this work was intended to find out if a big or smaller ball would travel farther when pushed forward with the same force. Two chairs were set up and draped with a towel. One person pulled back their arm until it hit the towel and then released the football. The spot was marked and measured. This process was repeated 50 times with each ball. The smallest ball traveled the farthest distance.

Project Number: JPS049

Grade: 6

Title: The Effect of Baking Soda, Sugar, and Salt on the Evaporation Rate of Water

Abstract: Abstract was not submitted electronically.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS050

Grade: 6

Title: Friction at it's Finest

Abstract: We see friction all around us. This project tests two types of friction: sliding and rolling friction. In the rolling friction test I run model cars down a ramp on four different surfaces; then measure distance and compute an average. For the sliding friction test I measure force as a five-pound weight is pulled across the same four surfaces. Force divided by weight equals a measure called the coefficient of friction. Plywood was the surprising winner in the first test, while foil had the lowest coefficient of friction in the second test, which was predictable.

Project Number: JPS051

Grade: 6

Title: Treated Vs. Untreated Wood

Abstract: People spend a lot of money applying protectants to their outdoor wooden decks. This work intended to find out if applying wood protectant to wood keeps the wood strong. Each week one sample of treated wood and one sample of untreated wood were placed outside and left. The samples were then broken at a laboratory, and the peak force required to break each sample was recorded. It was determined that treated wood is stronger. However, the difference is not that great. A significant difference was noted in the appearance of the wood: the untreated discolored and got moldy.

Project Number: JPS052

Grade: 6

Title: Effect of Temperature on Tennis Balls

Abstract: I was curious to see if I should play tennis with a heated tennis ball. I did this project by taking six tennis balls and labeling two tennis balls each. I put two tennis balls in the oven one of them had a thermometer in it to tell the temperature of the ball. The other tennis ball was to test how high the tennis ball would bounce when it was heated. My results showed that the tennis ball that was heated bounced higher. The room temperature ball was next and the ball that was in the freezer was not affected.

Project Number: JPS053

Grade: 6

Title: Stop Sign Stoppers

Abstract: Have you ever thought about stop signs? Well, even though there are laws, people don't always obey them. One way to find out would be for you to go check it out for yourself ; actually see if people stop or not. This could seem like a dumb question, but some people never think about it. In my experiment, I recorded the percentage of people who made a complete stop at a stop sign. I also compared whether males or females make more complete stops.

Project Number: JPS054

Grade: 6

Title: No Barometric Blues

Abstract: The experimenter ran twenty tests on a homemade barometer. The test was to see if the barometric pressure was consistent with the weather outside. This experiment was done because the experimenter was looking for an accurate way to predict weather. The test went as follows: first, the experimenter finds whether the pressure is high or low, and by how many centimeters. Next, the experimenter checks the weather outside. The hypothesis for this experiment was right, seeing that the barometric pressure stayed consistent with the weather. Perhaps, this experiment could be run in a different climate and the results might change.

## JUNIOR DIVISION - PHYSICAL SCIENCE

Project Number: JPS055

Grade: 6

Title: Weather Forecasting Accuracy

Abstract: Did you ever feel like you could predict the weather more accurately than weather forecasters do? This project looked at the accuracy of predicting the Pittsburgh weather five days in advance by five different resources. Data was collected and scored over a three week period. The calculations were tabulated and graphed two different ways. The Weather Channel and KDKA scored best. Overall, even the winners proved to be losers with neither having scores to brag about. In order for this project to truly be valid it should be done over a longer period of time.

Project Number: JPS056

Grade: 6

Title: That's The Way The Wind Blows!

Abstract: The purpose for completing this project was to determine if wind direction has a significant impact on the outside temperature. I also wanted to determine if there were any specific wind patterns in our local area.

Project Number: JPS057

Grade: 6

Title: Germs + Sanitizer = More School?

Abstract: The purpose of this experiment was to determine if using hand sanitizer before eating lunch decreases the absentee rate of first and second graders. Ask four first and four second grade classes if they will participate. Type permission slip for participants. Give two first and two second grade teachers the hand sanitizer to use before lunch. Check absences for twelve days. My hypothesis was incorrect. Classes that used hand sanitizer had more absences than those that didn't. This experiment might be better performed if one is more specific about the reasons for absences.

Project Number: JPS058

Grade: 6

Title: Drip, Drip, Acid Rain

Abstract: I experimented with the effects of acid rain on the environment. My hypotheses was if an avocado seed, a piece of balsa wood, a metal bolt, and a stone are soaked in water and vinegar (same as acid rain) for two weeks, the seed would change the most. The one that changed the most was not the wood in the vinegar. I know this is true because it gained the most weight, height, width and broke into four individual pieces.

Project Number: JPS059

Grade: 6

Title: Boing

Abstract: Does temperature affect the rebound rating of a baseball?

.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS001

Grade: 6

Title: How Koi Fish Survive Outside In Winter

Abstract: Wintering Koi outside is a challenge. The pond must be cleared of debris and sludge to avoid pollutants in the water that might harm the fish during the winter. Each day during my report period I would check the pond To ensure the fish had access to an air hole. Plus I tested the water periodically in a cup with chemicals to show the water was good. In conclusion, koi can survive under ice covered water without food as long as there is a hole for air. Thus my hypothesis was wrong that they eat nourishment in the pond water.

Project Number: JLS002

Grade: 6

Title: Different Soils: Tallest Grass

Abstract: Does the type of soil affect how tall the grass grows? This project intended to learn if grass will grow better in the soil with the most nutrients (potting soil) than sand, dirt, mushroom manure, or a mixture. Grass seed was planted in six different types of soil and the growth of the grass was recorded. It was determined that the grass did not grow better in the soil with the most nutrients. It grew the best in a mixture of potting Soil and sand and grew equally as well in the dirt.

Project Number: JLS003

Grade: 6

Title: Does Drainage affect plant growth?

Abstract: My project was done to find out if indoor plants should be planted with drainage systems, and if so, what kind of drainage system. To do my experiment I put four different drainage systems (broken terra cotta pots, sand, stones, and marbles) and one pot with only soil in it. I planted a paper white in each pot and compared the growth of each plant to the plain soil pot and then to all the others. The results were that plants should be planted with drainage systems and the plant in stones performed the best.

Project Number: JLS004

Grade: 6

Title: Which household products will be more effective at extracting DNA from a Strawberry?

Abstract: The purpose of this experiment was to isolate DNA using common household detergents. The materials used included a vegetable source, isopropyl alcohol, powdered & liquid detergent, blender, water, measuring cups, and non-iodized salt. The plant DNA source was mashed by using a blender/masher. 15ml of detergent and 5g of salt were mixed with the vegetable and filtered. The fluid was measured and an alcohol was added. The DNA is then spooled out on a stirrer and the procedure is repeated. The results demonstrated that DNA could only be isolated using certain detergents but could be isolated from a plant source.

Project Number: JLS005

Grade: 6

Title: Dog vs. Human

Abstract: The purpose of this experiment was to find out which mouth is cleaner a humans' or a dogs'. The procedures to this experiment are: 1. Gather materials- 4 Petri dishes treated with nutrient Agar, 1 labeling marker, 4 sterile swabs, 4 sets of gloves, 1 incubator, 2 dogs, 2 humans and 1 camera. 2. Label the dishes-Dog 1-Dog 2-Human 1-Human 2. 3. Put gloves on. Take a swab, swipe human-1's mouth. 4. Lift cover off Petri dish, roll swab across the agar in a Z-shaped pattern. 5. Repeat step 3 and 4 with the other human and dogs. 6. Put the lid on the Petri dishes and put then in the incubator. 7. Check the dishes daily for bacteria growth. After

## JUNIOR DIVISION - LIFE SCIENCE

a few days the results clearly showed that human mouths are cleaner than dogs. The dishes labeled Dog 1 and Dog 2 showed bacteria first. After the experiment was completed, the Dog dishes had far more bacteria than the humans'.

Project Number: JLS006

Grade: 6

Title: Wet Timber!

Abstract: My science fair project was completed to help determine which type of wood absorbed the most water. Using five different types of wood (Birch, Cherry, Maple, Oak, and Pine), I hypothesized that Maple wood would absorb the most water. Eventually, I would like to build a house made of wood and this project would help me in determining which wood not use due to moisture content.

Project Number: JLS007

Grade: 6

Title: Forensic Handwriting Analysis

Abstract: was trying to find out whether a person can be identified by their handwriting. And I took 8 exemplars and I am going to overlay a projection sheet with the letter one of the students wrote the note and put that on top of the exemplars. Then I am going to examine each letter and see which one of the students wrote the note. Then I will form an opinion on to who wrote the note.

Project Number: JLS008

Grade: 6

Title: Juice

Abstract: The purpose is to determine which fresh squeezed fruit juice has the most vitamin C. 1. Make a vitamin C indicator. 2. Squeeze fresh juice. 3. Place indicator into five test tubes. 4. Add drops of juice to the indicator until it is clear. 5. Record the number of drops. 6. Repeat for each type of juice. 7. Repeat the experiment three times. I determined the orange juice has the most vitamin C. The vitamin C tablet changed the quickest, however, it was my controlled variable. The remaining juices came in the following order: #2 grape, #3 pineapple, #4 apple.

Project Number: JLS010

Grade: 6

Title: Flower Seed Growth

Abstract: I chose to do this project "Which Flower Seed Grows the Fastest" because my family wants to plant a garden with beautiful flowers. We would like to get the flowers quickly. I hypothesized that the Marigolds would grow the fastest. First I found a clear place to work and gathered my materials. I put soil and seeds into eight containers. I then labeled each container and put one in the garage and one in the sunroom. Every day I take a picture (at night) and water and record data (morning and night). My hypothesis was correct.

Project Number: JLS011

Grade: 6

Title: Retarding Mold Growth

Abstract: Plant oils have been used for centuries to combat germs. Do plant oils really work? Can their effect be seen on common bread mold? Five plant oils were tested on equal slices of bread sealed in plastic baags. After three weeks, the effect of the plant oils was significant. Two oils really did retard mold growth.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS012

Grade: 6

Title: Does Temp. Effect the Gender of Peeps?

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

Project Number: JLS013

Grade: 6

Title: Danger, Danger, Everywhere

Abstract: Statistically, boys commit more acts of violence than girls. This project was designed to test if boys rate high-risk activities less dangerous than girls. Ten boys and ten girls aged 8 - 12 were given pictures of ten sports and were asked to rank these activities on a scale, of one to ten, with ten being the most dangerous. Data showed the mean score for boys' as 6.16 while the girls' mean score was 6.68. There was minimal statistical significance to support the hypothesis. Further research might determine what physiological or social variables, other than perception of high-risk activities contribute to increased violent behavior in boys.

Project Number: JLS014

Grade: 6

Title: How tall does My Green Grass Grow

Abstract: My question was, what type of grass grows the tallest over a time period of 35 days. I staed that Chapon's Best of the Blues would grow the best because it was the most expensive. I used three different types of grass and grew them all under the same conditions. I chose kentucky blue grass as my control because that is what most people use in this part of the country. My hypothesis was proved incorrect because the rye grass grew the best. If I were to do this experiment again I would try to plant the seed outside during the spring.

Project Number: JLS015

Grade: 6

Title: Does the Color of Light Affect Plant Growth?

Abstract: Does the color of light affect plant growth? My hypothesis was that plants grow best in white or light-colored light. I grew one Brassica rapa plant in white light and three plants under red, blue and yellow filters. I observed each and recorded the data for 15 days. Plants grown in white light were the tallest and healthiest. Yellow-filtered plants had dark green stems and semi-thick leaves. Blue-filtered plants were tall, but skinny. Red-filtered plants were short and weak. Plants are affected by color. Plants grew best in white light, but the yellow-filtered plants were healthier than the darker-filtered plants.

Project Number: JLS016

Grade: 6

Title: Caffeine Effects on Bloodpressure

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

Project Number: JLS017

Grade: 6

Title: The Effect of Solutions on Water Evaporation

Abstract: The purpose was to test whether common substances, like salt, sugar, and soap, will change the evaporation rate of water. I believed that the water with the substances would evaporate slower. I used 1/8 cup of the ingredients listed mixed with 1 cup of de-ionized water in a total of nine mixtures, 3 of each solution. I used one control cup of water containing just the de-ionized water. I weighed each cup for a total of 15 days and recorded the data.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS018

Grade: 6

Title: Soapy Water

Abstract: When you wash your hands with soap, you never realize you are harming animals. This experiment was done to see what detergent pollution does to birds. One feather was put into a bowl with water and food coloring, and another was put into a bowl with water, food coloring, and soap. The results were that when a feather was put into a bowl with soap, it got wet on both sides and started to sink. When the lock of barbicels is broken water seeps through, and the bird sinks.

Project Number: JLS019

Grade: 6

Title: Do You Remember?

Abstract: This experiment was done to determine if memory truly gets worse as people age. In order to test this, ten people from three different age groups were given one minute to memorize twenty different pictures. They were then asked to write down as many objects as they could remember. The middle age group remembered the most. The youngest age group remembered more than the oldest age group. It was concluded that the older people had the worst memory. This was not because they were old, but because of external factors such as health conditions and medications.

Project Number: JLS020

Grade: 6

Title: What Effect Does Classical Music Have on Concentration?

Abstract: The purpose of my experiment is to see if listening to classical music will improve concentration. The procedure I used to test the effect of classical music on concentration was to have people play a memory game twice, once with classical music and once in silence. The memory game involved 40 cards with 20 pairs of Disney characters. The object of the game is to find the matching pairs as fast as possible by turning over only two cards at a time and trying to remember where each card was. Each participant was timed and their completion times were recorded. The completion times were compared to see if listening to classical music improved the participants' concentration and resulted in faster completion times. I used 10 participants in my tests. My results showed that 4 participants did better on the concentration test with music and 6 did better on the concentration test without music. My results do not support my hypothesis that listening to classical music will improve concentration.

Project Number: JLS021

Grade: 6

Title: Mold War Two

Abstract: My Experiment was intended to find out what kind of beverage would be the first to develop mold and if temperature would have any affect. I selected four common beverages, orange juice, Pepsi, coffee with milk and tea. I place one group of uncovered beverages in clear plastic glasses at room temperature and the second group of beverages in the refrigerator. It was observed that room temperature beverages developed mold faster and that coffee with milk was the first to form mold.

Project Number: JLS022

Grade: 6

Title: O2 Levels: Smokers vs Non

Abstract: Compare the difference between oxygen levels on smoker vs. non-smokers at rest and after exercise.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS023

Grade: 6

Title: Drawing Conclusions

Abstract: What is the difference between a third grader's sketch and the Mona Lisa? During the science fair at Community Day School, Danny Hoffman conducted a two sided experiment. (1) "Will participants think about an object more if someone else chose what they were drawing?" and (2) "Will children draw more elaborate pictures than adults?" The science project was introduced by science teacher Arthur Dickter. Because of Danny Hoffman's passion for drawing, the experiment was done. The results were participants will think about an object longer if it is chosen for them and kids will draw more complicated pictures than adults.

Project Number: JLS024

Grade: 6

Title: Spud Crud

Abstract: The topic I chose for my project was mold growth. My purpose for doing this project was to determine the best cooking method to cook potatoes. My hypothesis was that the potato cooked in the microwave will mold quicker than one cooked in a conventional oven. My control was a potato which was not cooked at all. I made sure that each of the potatoes were approximately the same weight and size and then looked up the directions for baking potatoes in cook books- temperature and time. Using a clear sampling grid, I found that the potato cooked in the conventional oven grew mold the quickest. I learn about different types of mold and how a microwave and conventional oven cook for very differently.

Project Number: JLS025

Grade: 6

Title: The Effect of Sport Drinks on the Pulse Rate After Exercise

Abstract: I conducted this experiment to find out which type of drink will prevent me from dehydration. I predicted that Gatorade would be the healthiest drink to consume after exercise. To prove this, I had my test subject drink 250mL of some popular sport and energy drinks. The subject ran a half mile sprint and the pulse rate was recorded before and after exercise. My data showed energy drinks reduced the heart rate quicker, but my research proved that over the long run sports drinks are healthier for you. Regardless of what you prefer just drink to keep from dehydration.

Project Number: JLS026

Grade: 6

Title: Does the Type of Water Matter?

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

Project Number: JLS027

Grade: 6

Title: Effects of Acid Rain on Plants

Abstract: Environmental groups have warned against problems related to acid rain. They have called for a reduction in the amount of acid rain. How much of a problem is it? How will an increased level of acid rain affect plants? Plants were watered every three days with acid rain of pH 2, pH 3, pH 4, pH 5, pH 6. The control was watered with water of pH 7. The soil was tested at the beginning of the experiment and will be tested at the end of the experiment. I had to do the experiment over, so I do not have my final results.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS028

Grade: 6

Title: The Effect of Music Preference on Reading Comp.

Abstract: The purpose of this experiment was to determine if listening to preferred music would be more distracting while reading than listening to non-preferred music. The procedure was to place the subject in a quiet room with a 6th grade PSSA reading test with preferred music in the music in the CD player. After completion, I began the second test with non-preferred music in the CD player. I repeated this process four more times. After grading all the tests, I found that the non-preferred music actually distracted the test subjects more than preferred music did. Three out of the five test subjects scored higher while listening to preferred music, disproving my hypothesis.

Project Number: JLS029

Grade: 6

Title: PAWZ

Abstract: Humans usually favor a hand or foot, but do dogs? An experiment was done to find out. Sixteen dogs were gathered and asked to give one front paw ten times. It was recorded in a notebook which paw they gave. Research and the experiment proved that dogs do have "pawdedness". Although further research had suggested that the preferred paw with dogs is split fifty-fifty, this experiment's results were that 60% of the dogs were left handed, and 40% were right. Future experiments will be done to find out about handedness in other animals.

Project Number: JLS030

Grade: 6

Title: Order of Questions and Answers

Abstract: Does the order in which questions are asked influence the answers? Third grade students will be divided into 2 groups. The students in group A will be asked their favorite color and then be instructed to take a jellybean of their choice. The jellybeans will be separated by color in jars. Group B will first take a jellybean of their choice than be asked their favorite color. A tally of the students' responses in relation to the order of questioning will be taken and compared.

Project Number: JLS031

Grade: 6

Title: Hold Your Breath

Abstract: Pollution is a serious threat that impacts plant life, the ecosystem and human beings. Small openings on the underside of deciduous leaves called stomata ingest particles from the air. Both organisms and plant life ingest pollution. In this experiment, I blocked the stomata of a plant with Vaseline causing it to hold its breath to simulate the effect of air pollution. My results reflected varying degrees of green pigment in the leaves of the plants that were coated with Vaseline. The number of days that the leaf was coated had a direct relationship on the amount of chlorophyll present.

Project Number: JLS032

Grade: 6

Title: Effects of Growing Mat. on Plant Growth

Abstract: The purpose of this experiment is to investigate if soil type affects the way plants grow. I will compare how fast plants grow and how many leaves the plants have when grown in soil with distilled water, sand with distilled water, and a mixture of soil and sand with distilled water. I chose this project because this past summer, I planted plants in my sand box with some soil. My

## JUNIOR DIVISION - LIFE SCIENCE

plants grew very well and I started thinking about if the plants would have grown as well if I would not have mixed the soil with the sand.

Project Number: JLS033

Grade: 6

Title: AAHH Refreshing!

Abstract: I love chewing gum. There are some brands of gum that make my mouth feel like it's on fire and there are some brands that make the inside of my mouth cool. What I wanted to understand, by completing this project, was whether the type of gum you chew has an effect on the temperature of the inside of your mouth.

Project Number: JLS034

Grade: 6

Title: Does Time of Day Affect Memory?

Abstract: The part of the brain that holds memory is called the cerebrum. This project intended to find which time of day is best for using your memory. My hypothesis was that the afternoon would be the best, because in the morning or evening you are tired. My materials were playing cards, a pencil, a blindfold, and four tactile objects. I administered three tests using different senses (hearing, touch, and sight). I tested each subject in the morning, afternoon and late evening, and recorded the data. The test showed that the best time for your memory is the evening, proving my hypothesis incorrect.

Project Number: JLS035

Grade: 6

Title: The Sound of Music

Abstract: Rap music is one of my favorite types of music. I notice, with myself, that when a certain rap song comes on that I enjoy, I get excited and into the music. The purpose for completing my project was to determine exactly how different genres of music affect an individual's pulse rate. I wanted to also establish if the more calming types of music has a greater impact on a pulse rate than that of heavy metal, Rap, or Country.

Project Number: JLS036

Grade: 6

Title: Human Memory

Abstract: I first typed my permission form. Then I gather a group of test subjects, then I split them up into three groups. I then formed my hypothesis. I spoke with the first Group on Monday and I had them study from Monday- Thursday then they took the test on Friday. I got the second group on Monday and they studied for one day and then they took the test on Tuesday. Then I spoke with the third group on Wednesday and they didn't get to study at all. The first group was my long-term memory group. The second group was my working memory group. The third group was my sensory memory group. After I tested all three groups I gathered my results.

Project Number: JLS037

Grade: 6

Title: Yeah, Write!

Abstract: The purpose of this experiment was to find out if there is a correlation between a person's handwriting style and their personality. Ten handwriting samples were collected on index cards, and with library reference books, I would study and analyze each handwriting sample. By careful examination and note taking, I was given the data needed to find the personality characteristics of each subject sample. The results have proven that there is a link

## JUNIOR DIVISION - LIFE SCIENCE

between a person's handwriting style and personality type. Your handwriting is a part of you personality and is what makes each of us unique.

Project Number: JLS038

Grade: 6

Title: Best area for growing mold slowest

Abstract: First I will get white, wheat, italian and rye breads and cut them into 2.5 cm chunks. The bread will be soaked in water and then placed in a container with the lid closed. I will have 4 containers. The containers will be clear so I won't have to open the lids. I will observe the growth of mold. I will test each bread three times.

Project Number: JLS039

Grade: 6

Title: Let There Be Light

Abstract: Plants and flowers make our world a more beautiful place to live. My intent was to determine which light source made the plants grow the fastest. Sunlight, black light and a regular household light bulb were used as the light sources. Grass seeds were planted in the small containers and put in separate closets with the black light on for twelve hours; the household light bulb was also put in a closet with the planted grass seeds. The last container was put on a shelf before a window with direct sunlight. The seeds which were in the sunlight sprouted first. Second were the seeds under the household light bulb and last the seeds came up under the black light. There is no substitute for natural sunlight, it is best for plants.

Project Number: JLS040

Grade: 6

Title: Affects of Hot Spots

Abstract: When a farmer or gardener is fertilizing their plants, whether by machine or by hand, occasionally an overdose of fertilizer may occur. My project is testing if an overdose of fertilizer has an effect on plants in or near this hot spot. There was the control plant tray, four times prescribed amount of fertilizer tray, and eight times regular amount of fertilizer tray.

Project Number: JLS041

Grade: 6

Title: Fruit Salad Science

Abstract: Do you find brown fruit less appealing? Many people do. References say that a little lemon juice will slow down the browning process of fruit. Two plates of fruit were tested. Each plate included an apple, orange, banana, strawberry, and grapes. On one plate, the fruit was brushed with a lemon juice mixture. Lemon juice slowed down the browning process. If others are interested in running this experiment, I would suggest using sweeter juices such as pineapple or orange juice to avoid the bitter taste from lemon juice.

Project Number: JLS042

Grade: 6

Title: Do People Remember Audio or Visual Better

Abstract: I did my experiment because I wanted to know if people would work better when listening to someone or seeing a book. To do my experiment I got students and showed them the pictures for 5 seconds and then asked them what they remembered. I gave them a tape recorder and then once that was over I asked them what they remembered from that. My results were that they remembered auditory did better than visual. My conclusion proved my hypothesis wrong they did better on auditory.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS043

Grade: 6

Title: Lunar Biosphere

Abstract: My project was to build a model of a lunar biosphere. A lunar biosphere is a habitable place on the moon. My biosphere has its own ecosystem. The reason that I picked this project is that I love space from our sun to the smallest bit of space dust, I love it all.

Project Number: JLS044

Grade: 6

Title: Effect of Household Chemicals on Plants

Abstract: The problem being investigated is "How will ammonia, dish liquid, and alcohol affect the growth and development of radish and sunflower seeds?" I predict that the household liquids will negatively affect the growth and development of seeds. I made a 10% solution of each of the household liquids. I used 30 radish seeds and 30 sunflower seeds during each experience. I repeated the experiment two times. I was surprised to find that the seeds in ammonia did better than seeds in plain water. For future experiments I would like to test different household chemical.

Project Number: JLS045

Grade: 6

Title: How SUGAR Affects Your Teeth

Abstract: I put 10 teeth into 10 different cups. Four ounces of five different products – chocolate syrup, Pepsi-Cola, Tea, Sugar and pancake syrup – were put into two cups each. One group I brushed everyday and the other group stayed in the product the entire week. I recorded the results each day and at the end of one week. The teeth that I brushed everyday looked better than the other group. The teeth that were put in Pepsi and tea showed the most damage. I would like to continue this project and use a microscope to accurately record the changes in the teeth.

Project Number: JLS046

Grade: 6

Title: What type of water is cleanest?

Abstract: The experiment tested tap, well, bottled, and distilled (control) water for bacteria, chlorine, copper, dissolved oxygen, iron, nitrate, pH, and phosphate. I did this experiment because my dad drinks Brita water, and I wanted to see if it was safe to drink. I got a kit, read the instructions, and did each test 5 times on each type of water. My results showed that bottled tap water had the least chemicals; well water had the most chemicals, and Brita and tap water were in the middle. Brita water had bacteria. I concluded that bottled water was the cleanest.

Project Number: JLS047

Grade: 6

Title: Sharing Out Air with Bacteria

Abstract: The environmental protection agency ranks indoor air pollution (dust, bacteria, etc) a health concern. As an indicator of this pollution, I measured bacterial content of the air of my bedroom, kitchen, car, and classroom using a microbial air sampler which fans air (200 liters) over culture strips. Bacterial counts are higher in occupied than in unoccupied rooms (30 colonies in classroom after dismissal; no colonies in classroom before school). The use of an air cleaner reduces bacterial content (occupied car, air cleaner off, 33 colonies; on, 11 colonies). In conclusion, bacterial content of the air relates to human occupation.

## JUNIOR DIVISION - LIFE SCIENCE

Project Number: JLS048

Grade: 6

Title: Heart Rate, Age and Exercise

Abstract: In my experiment, I wanted to figure out how age and exercise would affect a person's heart rate. I learned from text books and online resources that as a person's age increases, their heart rate decreases. I also learned that a person's heart rate will increase during exercise. My hypothesis was that older people would have a lower, more consistent heart rate through five minute workouts on a treadmill at different speeds. My testing proved this hypothesis to be correct. If someone were to try this experiment again, I would suggest testing more people of various ages.

Project Number: JLS049

Grade: 6

Title: What Birds Eat

Abstract: Birds have all types of foods they like to eat, but do they like one kind better than the other? Three types of food were set in a cage and timed to see which food the birds went for the fastest and most often. I came to the conclusion that birds prefer birdseed to the forest and fruit snackbars. Work to be done in the future is a comparison against different brands of birdseed.

Project Number: JLS050

Grade: 6

Title: The Pressure of Video Games

Abstract: Video games are addicting and fun to play but, if you have heart problems they could be dangerous. I wanted to see if your blood pressure went up while playing. I found out not only did it go up, the pulse also went up. I learned that pulse is related to blood pressure. The subjects involved in this experiment ranged in age from seven to eleven. Continued research may involve subjects of different age groups to show that blood pressure usually rises with age.

Project Number: JLS051

Grade: 6

Title: Helpful Hatching Hints

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

Project Number: JLS052

Grade: 6

Title: Water Retention in Soil

Abstract: I wanted to find out which soil is best for plants. I started by pouring 250ml of water through different types of soil. Then I planted sunflower seeds into six different clay pots, checked daily, and watered when needed. The seed planted in the topsoil (yard) sprouted 1st. Mixed soils seed sprouted 2nd and grew the best, clay seed sprouted 3rd. In conclusion, my hypothesis was correct. If I were going to do this experiment again, I would mix different soils together, plus add different amounts of water into the plants.

Project Number: JLS053

Grade: 6

Title: Your Mouth...Icy or on Fire?

Abstract: I did this project to see if the flavor of the mint and cinnamon-flavored gum effects the temperature of your mouth. I gathered ten volunteers, had them chew the two flavors of gum, and took their temperatures in timed intervals. The recorded temperatures showed that the majority of

## JUNIOR DIVISION - LIFE SCIENCE

the temperatures rose as they chewed. The flavor of the gum has absolutely nothing to do with the temperature of your mouth.

Project Number: JLS054

Grade: 6

Title: Effect of Electricity on Seeds

Abstract: This project was conducted to learn the effect of electricity on the germination of a seed. Lima beans were planted in two different cups. Wires were attached to a 9Volt battery and placed in the soil of one of the cups. The other cup was not attached to a battery. The plants were watered and observed over a 48 day period. The results were graphed and recorded. The plant attached to the battery grew at a faster rate. Further experimentation could be to attach plants to different levels of electricity to see the rate of growth.

Project Number: JLS055

Grade: 6

Title: Genetic Printing

Abstract: Did you ever wonder if people in this country have the same fingerprints? Or even family members? The purpose for completing this project was to determine if members of a family have the same fingerprints. I had hypothesized that there is a direct relationship between fingerprints and identity because when someone commits a crime, that person is usually identified by fingerprints.

Project Number: JLS056

Grade: 6

Title: What is in the Pittsburgh Water?

Abstract: What and how many bacteria are in Pittsburgh water? Tap water, puddle water, and rain water were each put on two Petri dishes, one with normal, and one with selective blood Agar. They were incubated for 48 hrs and examined. The results were that puddle water had the most bacteria and biggest variety, then the rain water and last, the tap water. The tap water may be cleanest because of chlorination, the rain water was surprisingly not sterile, possibly because it was not collected in a sterile fashion, and puddle water was, as expected, the most laden with bacteria.

Project Number: JLS057

Grade: 6

Title: How Plants React To Different Light

Abstract: The subject of this experiment was the effect of different types of light on four plants of the same species over a period of four weeks. My hypothesis was the expected order of health from healthiest to weakest was: Sunlight, Fluorescent, No Light, and Black Light. The result was that there was no BEST light option for this plant. The fluorescent light produced the best flowers. The black light produced the most leaf growth. The plant in sunlight produced a healthy plant with consistent flower growth over the four weeks. The plant without light shriveled, yet produced new growth.

## JUNIOR DIVISION - CONSUMER SCIENCE

Project Number: JCS001

Grade: 6

Title: What Stain Remover Removes Red Wine

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

Project Number: JCS002

Grade: 6

Title: Got Mold

Abstract: My question for this project is "Which Bread will Mold the Quickest-with or without preservatives?" I thought that the bread without preservatives would mold faster than the one without any preservatives. I used two different types of bread and placed the control bread in the refrigerator because we usually store bread there to keep it longer. I placed the experimental group on the counter at room temperature. What I found interesting was how quickly the bread without preservatives grew mold as compared to the other breads. It had mold growth about 28 days before the other groups showed signs of molding.

Project Number: JCS003

Grade: 6

Title: Which Whitener Whitens Whitest

Abstract: The purpose of this experiment is to find out which of the five tested toothpaste brightened the test eggs the best. The procedure I used to conduct this experiment is as follows: 1. Buy five major toothpaste brands, which have the word "Whitening". 2. Hard boil five eggs. 3. Brew ten cups of coffee. 4. Pour coffee in a large cooking pot. 5. Stain the eggs by placing them in the cooking pot of coffee for 24 hours. 6. Assign a number to each egg. 7. Assign a number to each brand of toothpaste. 8. Brush each egg with the assigned brand of toothpaste for one minute a day for two weeks. 9. Repeat steps two through eight for a second group of eggs. 10. Have all four of my family members (including myself) rank each egg from both test groups from brightest (being #1) to the least brightest (being #5). 11. For each test group, add the ranking assigned by each family member for a particular egg and divide by four. When the experiment was over we found out that Aquafresh Whitening did the best with 1.875, then Colgate Sparkling White with 2.000, then Ultra Bright Advance Whitening with 2.125, then Crest Whitening Expression with 4.375, and finally Aim Whitening with 4.625.

Project Number: JCS004

Grade: 6

Title: Yeast Metabolism!

Abstract: The purpose of completing this project is to determine which type of water temperature will result in better yeast production. I wanted to conclude if the activation of yeast is definitely affected by water temperature.

Project Number: JCS005

Grade: 6

Title: Does Cost Really Affect Battery Performance

Abstract: I wanted to see if more expensive batteries lasted longer than cheaper batteries. I did this because we use batteries a lot in my house and I wanted to see which one lasted the longest, Duracell, Energizer, True Value or Eveready. I took four of the same exact flashlight and put those batteries in each flashlight. I shined them on the same wall. I charted them every 15 minutes to see if they went or got dimmer. The results were that Energizer lasted the longest but Duracell costs the most.

## JUNIOR DIVISION - CONSUMER SCIENCE

Project Number: JCS006

Grade: 6

Title: Flashlight Bulbs: Light Your Way

Abstract: The purpose of my experiment is to answer the problem: Which flashlight bulb gives the most light? I built and used wooden fixtures, a flashlight, four flashlight bulbs (Standard, Rechargeable, Xenon, and Krypton), and a sensor set to answer this question. The flashlight was moved away in one-foot increments. The data showed highest signals near the sensor and lower signals further away. The Krypton bulb had the best readings and so was the best. However, at thirty feet, the Standard and Rechargeable bulbs both had the highest signal. This could be an alternative solution.

Project Number: JCS007

Grade: 6

Title: Home Remedies vs. Stain Stick

Abstract: Will home remedies work better on a stain than stain stick? The purpose of this experiment was to determine whether the home made stain remover worked better on the stain, than the stain remover bought from a store. The procedure of the experiment I performed was as follows: 1. Stained material with ketchup, chocolate and lipstick. 2. Treated stained material with home remedies designed to treat the stain. 3. Treated stained material with stain stick. 4. Washed stained material in hot water and Gain detergent. 5. Compared the results. After the experiment was performed I compared which stain removal worked the best at removing the stains. The Stain Stick did a better job on all the stains. My hypothesis was incorrect, I believed if you targeted a specific stain with a specific treatment it would work better. By far the Stain Stick was the winner.

Project Number: JCS008

Grade: 6

Title: May the Best Battery Win

Abstract: My question is, which battery works the best to power an electromagnet - duracell, energizer, or rayovac? I don't want to waste money on batteries, so I decided to see which would be the most powerful. After making the apparatus for the electromagnet and the battery holder, I conducted three trials with each battery. I found that the rayovac battery was the most powerful - picking up an average of 43 ball bearings. If I were to do this experiment again, I would use the wall outlet as the control group.

Project Number: JCS009

Grade: 6

Title: Rainbow Cheese

Abstract: Cream cheese is a well enjoyed spread for such things as bagels, crackers, and celery. My project was to see if people preferred one color of cream cheese over the others judging by visual appearance. Different color samples of cream cheese were given out to people. Then afterward they voted on which color they enjoyed the most and marked their answer on ballot sheets. Most people preferred the blue cream cheese over the other colors. The change in color of the cream cheese made a big difference.

Project Number: JCS010

Grade: 6

Title: It's All in the Bubble!

Abstract: Why does bubble gum stretch? The purpose for completing this project was not to only find out what causes bubble gum to create a big bubble but to figure out which type of bubble gum creates the biggest bubble.

## JUNIOR DIVISION - CONSUMER SCIENCE

Project Number: JCS011

Grade: 6

Title: Paper Towel Wars

Abstract: Paper towels are part of our everyday life. This experiment is to learn what type/brand holds objects better both wet and dry. Brand name, generic, and value brands were compared by testing them wet and dry and determining the number of marbles each paper towel could hold before breaking or caving in. It was found that Brawny was the strongest dry and Bounty the strongest wet. The testing showed great differences within different name brand, value, and generic paper towel groups.

Project Number: JCS012

Grade: 6

Title: Pumping Iron

Abstract: Did you ever wonder if your cereal actually contained iron as stated on the boxes and in commercials? The purpose for completing this experiment was to determine if there was actually iron in cereal as stated.

Project Number: JCS013

Grade: 6

Title: Pop Your Top with Soda

Abstract: Soda is one of my favorite drinks. It is also fun to burp. My experiment examined which soda has the most carbonation. I tested six different sodas. I put 1/8 cup salt in a balloon, opened the bottle and placed the balloon over the top. When the salt and the soda mixed, its reaction caused the gas to escape into the balloon. I measured the volume of gas by displacing water in a submerged beaker. I tested each soda three times to get an average. Coke products had the most carbonation. If you're in the mood for burping, drink Sprite.

Project Number: JCS014

Grade: 6

Title: Which Glue Holds The Best?

Abstract: The purpose for completing this project was to determine which type of glue works best with wood. I hypothesized that hot glue from a hot glue gun would result in creating the strongest bond.

Project Number: JCS015

Grade: 6

Title: Consumin Lumens

Abstract: My project will test different brands of light bulbs to see which ones last the longest and which has the greatest value. The greatest value will be the bulb that lasts the longest but costs the least.

Project Number: JCS016

Grade: 6

Title: Dip the Chip

Abstract: The purpose of my project is to find out which brand of potato chip holds the most chip dip. The following is a brief description of my procedure. 1.) Weigh the potato chip. 2.) Keep adding chip dip until the chip breaks. 3.) Weigh the dip and chip together on scale. 4.) Subtract weight of the potato chip from the final weight. 5.) Record and repeat. Herrs potato chip held the most chip dip then Ruffles, Lays, and Pringles.

## JUNIOR DIVISION - CONSUMER SCIENCE

Project Number: JCS017      Grade: 6

Title: The Most Accurate Pittsburgh Weather Station

Abstract: To find out which local television station was the most accurate at predicting the high/low temperatures for a given time period. I used WTAE, WPXI, KDKA, and The Weather Channel. I got 22 days of predictions making the total of predictions 44. I charted the predictions and the actual temperatures on each station's chart. I calculated all the exact predictions and predictions within 2 degrees high/low of the actual temperature. This was done to see if the same station remained the most accurate. The results show #1-KDKA-1 high prediction correct, 2 low predictions right. 2 degrees added/subtracted, correct 27%. #2-WTAE-1 high prediction correct, 1 low prediction correct. 2 degrees added/subtracted, correct 25%. #3-WPXI- 1 high prediction correct, 1 low prediction correct. 2 degrees added/subtracted, correct 23%. #4-The Weather Channel- 2 high predictions correct, 0 low predictions correct. 2 degrees added/subtracted, correct 20%.

Project Number: JCS018

Grade: 6

Title: Which diaper to Trust?

Abstract: Diapers are for children who can't use the bathroom. This experiment was to determine which brand of diaper is the best to use. I tested three different brands of diapers. I added one cup of water at a time. Then I found out that Pampers brand diaper was able to hold the most water before leaking.

Project Number: JCS019

Grade: 6

Title: Clean Me!

Abstract: For my project I was trying to figure out if certain temperature and certain type of detergent would make a difference in removing stains.