



Pittsburgh Regional
**SCIENCE &
ENGINEERING** Fair
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78th Pittsburgh Regional Science & Engineering Fair

Junior Division

Behavioral and Consumer Sciences (JBC)

Student Project Abstracts

March 31, 2017

Notes to Judges

Students prepare Abstracts limited to 100 words that include the following:

- Purpose of the experiment
- Procedures used
- Data
- Conclusions
- Possible research applications
- Minimal reference to previous work
- For continuation projects, the abstract should focus on work done since the last PRSEF
- Should not include: a) acknowledgments, or b) work or procedures done by the mentor

Many students continue their research after the Abstract is submitted, and therefore the Abstract may not fully represent the Project.

Abstracts are available to the Judges prior to the Science Fair as an aid in pre-screening the Projects. Judging is to be based on the actual Project as presented by the student.

Project Numbers are assigned as XYYABC

- X: J-Junior Division (6th grade)
- YY: Category Name
 - BC - Behavioral and Consumer Sciences
 - BI - Biological Sciences
 - CH - Chemistry
 - PE - Physical Sciences & Engineering
- ABC: Project number
 - 1xx or 2xx - Individual student projects
 - 3xx - Team projects (2 or 3 students)

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Behavioral and Consumer Sciences (JBC)

JBC100: Leaking Diapers

The purpose of Leaking Diapers is to find out which diaper brand would be the most absorbent. After gathering the material, each brand was tested by dipping each diaper in a pan of water. The data shows that Little Journey diapers were the most absorbent. The hypothesis was that Pampers diapers would be the most absorbent because it was the most expensive. The data was not supported by the data. Pampers diapers have thirteen layers; so after the experiment, Pampers diapers felt the driest of all the diapers tested.

JBC101: Sweet Beat

In the Sweet Beat investigation, the data showed that the music does raise the heart rate. The purpose of the experiment was to see if music raises heart rate. The procedures are to first gather all materials. Then, play a pop rock song while subject one is doing physical activity. After, check subject one's heart rate. Finally, have subject one repeat steps 2-4 with a classical song and repeat whole process while resting. The data has shown that when listening to a pop rock song the heart rate does raise and when listening to a classical song, it decreases.

JBC102: Laundry Quandry

Every laundry detergent claims they are number one. I wanted to find out which detergent removes the most stains. To get my results, fabric was stained with paint, grape juice, pizza sauce, vegetable oil, printer ink, hot fudge, and jam and washed with either Tide, All, Cheer, Wisk Deep Clean, Seventh Generation, or without detergent. Stains were compared, proving my hypothesis correct that Tide would get rid of the most stains. My experiment proves there is only one detergent that is the best for washing clothes.

JBC103: Does Distraction Reduce the Amount of Discomfort a Person Feels?

Determine if distraction reduces the amount of discomfort a person feels. A person who is distracted will be able to tolerate discomfort longer than one who is not distracted. Final results will be available on Fair Day.

JBC104: And the Moisturizer That Keeps Skin Moist The Longest Is

Does your skin get dry easily? Dry skin is a medical problem for many people around the world. I designed this experiment to find out which product keeps skin moist the longest. I am curious to know what ingredients help create a stronger lotion and what makes a lotion moisturize skin. By testing moisturizers such as: Olay, Suave, Equate, Vaseline, Aveeno, NIVEA, and even pure olive oil work on JELL-O, I was able to identify which moisturizer worked best. Results will be displayed on fair day.

JBC105: Do Males or Females Complete a Paper Maze Faster Backwards?

Purpose: Determine if males or females complete a paper maze faster backwards. Hypothesis: Males will complete a paper maze backwards faster than females. Conclusion: Available at fair

JBC106: Science of Spins

A figure skater complete a scratch spin by rotating and pulling their arms in close to their chest. In my experiment, I completed four rounds of scratch spins. Each round, I did one scratch spin with my arms pulled in and one with my arms pulled out. I counted the rotations per spin and length of time per spin. I found that you rotate more times per spin with your arms in. However, there was not as great of difference in time.

JBC107: Determining which handwashing products kill bacteria most effectively

I tested the effectiveness of different hand cleaning products such as antibacterial soap, regular soap, and hand sanitizer. I wanted to see which product could kill the most bacteria in dirt. I grew the bacteria on agar plates and saw a large difference between the antibacterial soap versus other products: fewer bacteria grew from dirt that was added to an antibacterial soap solution than to a regular soap solution or to hand sanitizer. I then measured the growth rate of bacteria in liquid culture and found that the antibacterial soap completely stopped bacterial growth.

JBC108: Which Solution Cleans Coins Best?

My experiment was to clean coins with different solutions and see which cleans the best. I chose six solutions and soaked four different coins in each solution overnight. Then I scrubbed each coin and rinsed them off. I observed and recorded the condition of each coin before soaking, after soaking, and after brushing. Solution 1 (lemon juice) was proved to be the most effective solution for cleaning coins. It was the only solution that cleaned coins without scrubbing. After scrubbing, a number of coins were cleaner, but those cleaned with lemon juice were the cleanest.

JBC109: Boxed vs. Bottled- Which Water Stays Cooler Longer?

The purpose of my experiment was to find out which water stays cooler longer – boxed water versus bottled water. Temperatures were measured before going into the refrigerator, in the refrigerator, and after being in the refrigerator. My results showed that bottled water actually stays cooler longer despite the insulation within boxed water. This could be due to the bottled water and the substances in plastic rather than cardboard.

JBC110: Tough Cleanup

The purpose of this experiment is to find out which paper towel brand and design is best for cleanups. First, pour 15mL of water on each of the five paper towel strips per brand. Then, hold the paper towel 16cm above counter, and start putting pennies on the paper towel strip. After completing this, the data shows that Scott is the best for cleanups, holding an average of 193g worth of pennies.

JBC111: Buinea Pig Move

The purpose of my experiment was to find out if guinea pigs could learn the correct path to get their food after navigating their way though a maze. I ran each guinea pig through the maze for 5 days and each time the guinea pigs got faster.

JBC112: Does the Color and Height of a Box On a Shelf Affect a Persons Preference?

Purpose: Does the color/position of a package affect consumer preference? Conclusion: Available fair day.

JBC113: Staying Warm When Wet and Windy

Wind chill and moisture are two factors that affect your ability to stay warm while outdoors in winter. One option is to wear layers; another suggestion is to wear fleece or wool rather than cotton. I will test the ability of these choices to retain heat under dry, windy, and wet conditions using NXT Robot thermal probes to collect the data. This has applications to public safety, but also to the military in the design of uniforms.

JBC114: Twin Telepathy

Twin Telepathy is a project that is about finding out if identical twins, fraternal twins, or siblings think more alike. It is completed by giving a pair of identical twins, fraternal twins, and one of their siblings a questionnaire in a quiet room. Whatever group, (identical twins, fraternal twins, or a sibling with a twin), has the most answers relatively similar, on average, thinks the most alike. The data collected shows that fraternal twins think more alike than siblings and identical twins because of nurture, or the sum of environmental factors that affects the way living organisms thinks or acts.

JBC115: Which Household Cleaner will Fight Bacteria Beter?

My science experiment was to see which household cleaner would fight against bacteria better. I sectioned off a cutting board into four equal pieces. I took a piece of lunchmeat and rubbed it all over the board leaving it out all night. The next day I cleaned the board with four cleaners distilled water, diluted beach, diluted rubbing alcohol, and Lysol. I cultured the board and put them in agar dishes in an incubator. After 36 hours I collected my data, the results were distilled water 40 colonies diluted bleach had 2, diluted rubbing alcohol had 5 and Lysol had 1 colony. I learned that Lysol was the best.

JBC116: Which Agent Cleans Wheels the Best?

My experiment was what cleaning agent cleans a car wheel the best. I was also trying to see if a wheel cleaner is better than household cleaners. The first thing I did was pick five wheel cleaners that I thought were good. Then I picked two household cleaners. Next it was time to do the experiment. First we got the wheel dirty. Then we sprayed the cleaners on the wheels. We made sure not to leave the cleaners on the wheel too long. I made a prediction that Meguire's would work the best. I found out that my prediction was right. It turns out that wheel cleaner is better.

JBC117: Does Eye Color Have an Affect On Your Ability to See Different Colors?

Purpose: Determine if eye color has an effect on the ability of a person to see different colors. Conclusion: Final results available at fair

JBC118: Where to Meat?

Evidence suggests the beef industry is infrequently inspected and underregulated with unsanitary, inhumane conditions in its plants and feedlots which may pose a health hazard to consumers. My experiment provides a scientific assay of accuracy in labeling and properties of meat such as drugs and bacteria. The goal of my project was to see if high prices for grass fed or leaner meats correlate with quality. I collected my data by measuring water, fat to lean tissue, bacteria count, remaining antibiotics, and soluble protean content. My hypothesis was disproven because Whole Foods meat showed higher quality than the butcher's meat.

JBC119: Do different styles of music affect blood pressure?

In my science project I wanted to see if a person's blood pressure would be lowered or made higher if they listened to different genres of music. Participant listened to five types of music while relaxing in a chair. They listened to rock, rap, jazz, classical, and country music. After listening to each type of music for two minutes, their blood pressure was taken. The data showed that music did change the participants blood pressure but not dramatically. I think the person's blood pressure actually changed based on their tastes in music not in the genre they listened to.

JBC120: The RelationShip Between Healthy Lifestyle and Bone Structure

Osteoporosis is a serious problem worldwide, mainly because of the consequences of the diagnosis. However, many osteoporotic fractures can be prevented and treated. The purpose of this project is to determine the relationship between lifestyle and bone structure in women. I tested which lifestyle is better for women, and measured their blood pressure. I tested six people in all, and grouped them based on how healthy they were. Group A was made of unhealthy women, and group B was made of healthy women. My hypothesis was correct, the healthy lifestyle helped bone structure and physical health.

JBC121: Will People Remember Pictures of Black Objects On a White Background Better Than White Objects On a Black Background?

PURPOSE Determine if people remember black on white or white on black better? Conclusion: Final Results will be available Fair Day

JBC123: Toothpaste Battle

My project is about finding the brand of toothpaste that makes your teeth whitest. I chose this when I was going through my day, finding things to test, then I came to toothbrushing. I found four toothpaste brands including water, and hard boiled eggs to test them on. I soaked them in coffee to resemble the food. I had 30 eggs, and I assigned each brand and water to three eggs, and saved the others for a follow up test. I brushed each egg with ½ milliliter of toothpaste/water for 60 sec. I found that the winning brand was Ultrabrite.

JBC124: The Life of a Battery

I studied how long three different brands of AAA batteries would last if used continually in a flashlight. After a long time of experimenting, the Sony batteries lasted the longest. I predicted that Duracell would last the longest but Sony beat Duracell by 201 hours. Sony lasted 530 hours. Duracell came in second, lasting 329 hours, with Energizer (so far) in third with over 250 hours of energizing. The Sony batteries lasted longer than I expected them to last. I expected them to last only about two weeks.

JBC125: Font Phenomenon

In the Font Phenomenon investigation, the question was: "What font size reads with the greatest number of words per minute?" All subjects read three different articles typed in various font sizes. The scores were counted and averaged. Size 11 had an average of 136.6 words per minute, size 15 had an average of 141.4, and size 20 had an average of 137.6. The data proved that a subject can read the greatest number of words per minute aloud when the size was 15. Size 11 was too small and size 20 was large enough to obstruct the subjects view.

JBC126: Homework Blues

The purpose of my experiment was to test a person's ability to study/memorize groups of numbers and colors with and without distraction. In my experiment I asked each participant to study lists of numbers or colors and then recall the items on the lists. I performed two trials without distraction and two trials with distractions, I then compared the results. At the end of the trials my data revealed no overall difference in memorization between the distraction and the non-distraction trials. My hypothesis that distraction would affect a person's ability to study/memorize was not supported.

JBC127: Washer War

The purpose of Washer War is to test five brands of laundry detergent on the different stains to see which laundry detergent does the best job removing the visible surface area of each stain. While doing this experiment five shirts were stained with three of each stain the shirts and detergent were washed and dried. Stains were measured and calculated the surface area of each stain. The data from the experiment showed Tide as the leading brand and Xtra as the worst at removing stains.

JBC128: Is the Most Expensive Nerf Gun the Fastest?

The goal of this project is to find if the most expensive NERF gun has the most velocity. In a very large room, I will set up the NERF guns on the floor at a 45 degree angle. Then, I will paint the tips of the darts with washable paint, so I can measure the distance when it lands on the floor. I will also use a stopwatch to time each shot. The formula to estimate velocity is $v=d/t$. V = velocity. D =distance. T =time. My hypothesis is that the most expensive NERF gun will not have the most velocity.

JBC129: Which Thermos stays the warmest?

In this experiment I tested if the thermos really stayed warm for the amount of time that said on the label. I also tested a Ball Mason Jar and that just stayed at room temperature. For the thermos that stayed warm for nine it was only two degrees away from reaching 140 degrees at 10 hours. If it is lower than 140 degrees than the food can start growing bacteria. I also learned that the insulation is a vacuum. A vacuum is a stronger insulator than metal because it sucks out all the air so the thermos keeps your food warm. That is what I learned in this experiment.

JBC130: Quicker Picker Upper

The purpose of my project is to find out which paper towel brand is most absorbent. I conducted five trials to see what paper towel brand could hold the most pennies. The brands used are Bounty, Sparkle, Viva, Brawny, and Giant Eagle paper towels. I used a cup and fastened the paper towel with a rubber band. I then poured 2.5 millimeters of water on the paper towel. Then I put the pennies on by tens. Bounty held the most pennies when compared to the other brands with an average of 540 pennies, which supports my hypothesis.

JBC131: Does Handess Influence Personality

The hypothesis of my experiment was that right and left handed people have different character traits, and that left handed people as a group have more similar character traits than right handed people. I had 15 left handed people and 15 right handed people take the Myers-Briggs Personality test. I compared the answers of both groups. My conclusion was that my hypothesis wasn't completely correct. Right and left handed people do have different character traits. Left handed people as a group have less character traits in common. Right handed people as a group had more similar character traits in common..

JBC132: A cup of joe vs The stain Removers

The purpose of my experiment was to test which of these three whitening mouthwashes would whiten the best, Colgate Optic White, Crest 3D white and Listerine Healthy White. The procedure was to swirl the eggs in mouthwash for 60 seconds twice a day. The data is that group 1 was the worst whitening mouthwash and group 3 whiten the best. Group 3 was Crest 3D White which was the best out of the three.

JBC133: Wood vs. Composite Hockey Sticks

My hockey-based project is to be able to show the difference between a wooden hockey stick and a composite material stick by testing the speed from the two of them. I play hockey and I started to use a wooden stick which I thought was great since it was heavier and easier to shoot with until I found the composite stick which was easier to grip and much lighter. I am torn between these two sticks so this project is trying to find the ideal fit for me and other hockey players everywhere.

JBC134: What is the Fastest Way to Cool A Can of Soda?

Please visit student's exhibit.

JBC135: It's Written All Over Your face

The purpose of my experiment is to help people communicate better. I want to find out if males are better at reading emotions than females. To do that I will show a picture of a face to a male and see if he knows what emotion it is. Then I will show the same picture to a girl and see if she knows the emotion. I will show each person five pictures with five different emotions. After testing all the people, I figured out that girls are better at reading facial expressions than the boys are. My hypothesis was right because I said that females are better at reading emotion than men.

JBC136: Like Running? Play This!

I like to run and I play sports. I was curious to know in which sport, players run the most. The purpose of my experiment was to inform people about which sport involves more running. I found running statistics for top runners from different sports from sports websites. Then I tabulated the data, analyzed it, and used statistics to find the sample mean. I also drew graphs. Finally, I drew my conclusion using my data analysis. I found that soccer players actually ran the most rejecting my hypothesis that football players ran the most.

JBC137: Radar

Purpose Statement: What is the effect of radar on different objects? Hypothesis: I think that objects that are smooth and large will be detected and objects with many sharp edges and are small won't pick up on radar. Conclusion: Available on Fair Day.

JBC138: Soapy Circles

Germs live everywhere and can cause illness. My project investigates which type of household soap, laundry, dish, or shampoo, has the strongest surfactant. I used floating ground pepper in place of germs, and measured the diameter of the circle cleared by one drop of each type of soap. I concluded that the dish soap contained the strongest surfactant, disproving my hypothesis that laundry soap would be most effective.

JBC139: Out of the Blue

My experiment tested which color of text – black, red, blue, or green – participants remembered the most. A set of six participants looked at 20 words in each of the four font colors for forty seconds. After looking at each list, the participants waited for thirty seconds and then wrote down as many words as they remembered. I completed three trials and the results showed that blue colored font provided the greatest retention. My initial hypothesis was that red font would have the greatest retention. However, red font had the worst retention with the order being blue, black, green, and red.

JBC140: Battle of the Stain fighters

The purpose of my experiment was to help messy people find the best remover for their stained things. Cut a sheet into equal squares and stain them with the different stains. Let the squares air dry after you have washed them for one cycle. Lastly, use your color scales to score each square, 1 being the lightest shade. My data showed that grass was the hardest stain to remove and grape juice was the easiest stain to remove. In conclusion my hypothesis was incorrect. I predicted that Oxiclean would be the best but the winner was Spray N' Wash Max.

JBC141: What Brand of Cheese Molds the Quickest?

My topic tested cheese on how long they would last before they grew mold and how many preservatives they have. I did this experiment so you would know which one you might want to buy. I bought four different types of cheddar cheese and cut off a slice of each one. There was an organic brand, a local brand, and two mass produced brands. I left them out at room temperature for a couple weeks to see which one molded the quickest. My hypothesis was that the organic cheese would mold 1st given that it would have the least amount of preservatives and I was right. The one that didn't mold was Heluva Good which was due to the fact that it had the most preservatives, the 2nd one that molded was Cabot then McGinnis sisters molded 3rd.

JBC300: No Laughing Matter

We researched whether people could tell the difference between real and fake laughter; if it made a difference if people saw only visuals, heard only sound, or experienced both together, and whether age or gender impacted that ability. We surveyed people ranging from ages 8-90. We hypothesized with just video or sound it would be easier to tell the difference, and that females would do better because from our previous research, they seemed better at noticing hints in body language. Our hypotheses were partially supported. Females did better when they were younger and males did better when they were older.

JBC301: Effects of Vid. Game on Cognitive Thinking, Heart Rate and BP

This experiment's purpose is to find out exactly how video games that people play actually affect them. This is because the majority of the sample population play these games, and this could seriously harm them if we don't know what happens. The procedures of this experiment are: We give them a random quiz, and take their BP, and HR. Next we let them play. Finally we repeat step one and see whether they increased or decreased. Our conclusions will show whether video games are helpful or harmful, or neutral.

JBC302: Comparing Glass Cleaners

We researched what type of glass cleaner would clean the best for dirtied glass. Even though Windex had a very good reputation and ratings, we hypothesized that the organic glass cleaner would clean the best because it has less harmful chemicals. We also used Mrs. Meyers, dollar store glass cleaner and 7th Generation. We dirtied the glass with butter, dirt, baby powder, ketchup and Eos lip balm. Everything was in the same environment so it could not affect the outcomes of the procedure. We concluded that 7th Generation did the best cleaning out of all the testing materials.

JBC303: Ready, Set, Pop!

We decided to do our experiment on popcorn because it is America's favorite snack food. Our purpose to do this experiment was to discover which popcorn had the least amount of kernels after popping. We experimented with a low, medium, and high priced brands of popcorn. Our hypothesis was that the medium priced popcorn would have the most popcorn with the least amount of kernels leftover. We performed several trials using different cooking methods; stove top and microwave. Also, we used two different time constraints to ensure that we were getting an accurate result. Therefore, a total of 4 trials were done. For each trial, we counted and recorded the unpopped kernels. The overall average of unpopped kernels for the low, medium, and high priced brands were 57, 74.25, and 70.5 respectively. The low priced popcorn did better than the other brands. We thought that the medium priced popcorn would do the best because it was at a good price and would have a better quality. Since the low priced brand was at a cheap price we assumed that it was going to yield poor quality. In that case, we were wrong since the low priced popcorn did the best of the three brands. We know our experiment had an effect because now we can apply our knowledge to make a smart decision when we are going to buy popcorn.

Biological Sciences (JBI)

JBI100: So Tell Me-What's in Your Soil?

Does the soil location affect its acidity? I hypothesize that the evergreen soil will have the highest acidity. Go to the location. Take your auger and dig up 236.59ml of soil. Place your soil into your 236.59ml bucket. Pour 88.72ml of water into the bucket, and let the soil absorb it. Push the pH meter probe into the soil. Read the meter to find the pH of your soil. Repeat 3 times for each location. I found that the evergreen soil gave me the highest acidity. If I were to do this project again, I would change my types of soil.

JBI101: Salty Situation

In my project I tested how sodium would affect plant growth. I did it by adding salt to the water I give to the plants. The results told me that the amount of sodium added to the diet of the plant can affect the growth in a bad way. My hypothesis was correct, I predicted the the amount off sodium added to the diet would decrease plant growth. I will try to make people more aware of how sodium can affect plant growth.

JBI102: Effectiveness of Household Water Filtration Systems

I am concerned with how polluted (bacterial) the various sources of water in Allegheny County region and how effective is boiling water that is normally used to make water safe for human consumption. I think that the various water sources of water will have different levels of pollution (bacterial) but boiling the water will reduce the amount of pollution in the water. This research is important because lots of people use the water boiling method at home to make their water cleaner. This experiment will help show the effectiveness if boiling your water really does kill the bacteria growing in the water.

JBI103: Spin Cycle

PURPOSE: Does water really spin counterclockwise when it drains in a basin in the Northern Hemisphere because of the Coriolis effect? Can the direction it drains be affected by changing some factors? HYPOTHESIS: I think water will drain counterclockwise most or all of the time if it starts out perfectly still due to the spin of the Earth (Coriolis effect). I also think the certain factors, like motion, location of the drain and shape of the container could affect the direction water drains.

JBI104: Does Fly Ash Negatively Affect the Germination, Growth and Dry Biomass of Plants?

Purpose: Does fly-ash have a negative effect on plant growth? Hypothesis: The growth of plants will decrease as the concentration of fly-ash in the soil increase. Conclusion: Final results available at fair

JBI105: What bacteria is in tomatoes?

After doing research, I wanted to find out if the tomatoes that I was using for my project had any of the diseases that I mentioned. What, if any, bacteria will my tomatoes contain? Procedures: 1. Used four small grape tomatoes. 2. Washed my scalpel to be sure to remove all of the bacteria so that I did not contaminate the tomatoes. 3. Under supervision, I carefully cut the tomatoes in half. 4. Used half of the tomato and put it under the microscope so that I could examine the inside and the outside skin. I was looking for any bacteria, black mold and seed sprout. 5. Analyze the data.

JBI106: Strawberry Lab

PURPOSE: What is the effect of different storage methods on the molding of produce? HYPOTHESIS: I think that a green container will keep the food fresh longest because it is probably the most airtight. This will prevent mold spores in the air from reaching the produce and will keep the produce fresh the longest.

JBI107: The Eggs are Coming

Chicken's produce many eggs. If the size of the egg is increased, it can provide more food for people. I wanted to discover what would make a chicken egg bigger. I started feeding my chickens calcium in the form of oyster shells along with their normal daily feeding which consist of normal pellets and water. I thought calcium would make the eggs larger because the shell of the egg is mostly made of calcium carbonate crystals. Each day for two weeks I checked for eggs. My hypothesis was rejected and the chickens laid zero eggs.

JBI108: Coke Verses Koolaid Fertilizer

I wanted to learn if different substances could act as fertilizers. I used Coca Cola and Koolaid. I added some of each to my plants and observed them daily. They did not fertilize the plants but there was mold on both plants at the end. Neither plant benefitted from the substances.

JBI109: Oil Spill Cleanup

The purpose of the experiment is to determine which absorbent materials will clean up oil the fastest. Both pond water and seawater will be used to simulate actual environmental conditions. The materials will be cotton, wood chips, sponge and paper. The time to collect oil will be measured and compared for each material in each water type. Due to the negative effects of oil spills, it is critical to select the most absorbent material to quickly clean oil spills that occur in salt water and fresh water locations.

JBI110: Succulent Plant Growth

I tested how fast succulents grow with and without human interaction, and how water amounts affect their growth. My hypotheses were that succulents would grow more with human interaction (because of more carbon dioxide) and that they would grow more with less water (because they are drought tolerant). I experienced three problems: (1) watering caused my succulents to settle in the soil (2) succulent growth patterns are unpredictable and difficult to measure (3) my measuring method was not exact. As a result, my experiment did not provide information that would help me know whether or not my hypotheses were correct.

JBI111: Music's Effect on Plant Growth

In my experiment, I tested to see what effects music had on plants. I had three categories of plants' pop, which I played pop music to; classical, which I played classical music to; and control, which did not receive any music. I played music to the plants at least three times a week in forty-five minute periods. They each received thirty milliliters of water each day, and were all put in the same area which received the same amount of sunlight. I measured the plants once a week for three weeks. At the end of the three weeks, I found out that the pop group had the tallest average height of the plants. In conclusion, music had a slight effect on plants, making them grow more.

JBI112: Yeast Dough

My project is that if I put warm water in a bowl and cold water in a bowl with yeast which will rise faster. I did this project because I wanted to see which will rise faster so if you want to make yeast dough you can make it faster. I also did it to help today's society. We took cold water at 60 degrees and warm water at 100 degrees. Then I mixed the yeast with the water. Then add it to flour and salt. The results were that the warm water rose and the cold water deflated but while I was mixing there was no difference and when it started to rise there was the difference. The plan followed up because my hypothesis said that the warm water would rise faster.

JBI113: Is Preen really that Green?

Herbicides destroy unwanted vegetation. Pre-emergent herbicides form a chemical barrier that kills the weed by inhibiting root development of newly germinated seeds. The manufacturers claim that pre-emergent herbicides will not harm plants that are already growing. In this study, the impact of a common pre-emergent herbicide on seedling growth was measured. Keeping all plant growth factors (i.e. sunlight, water, nutrients and temperature) constant, a pre-emergent herbicide was applied to an experimental group of seedlings. When compared to the control group, the seedlings exposed to the pre-emergent herbicide were smaller, had fewer blooms, weighed less and had less developed root structures.

JBI114: Water Purification

Purpose Will it be possible to distill dirty or muddy water using evaporation. Hypothesis What I think will happen is the the water will evaporate from smaller containers into one large container. Why I think that will happen is because the water will evaporate and the dirt particles will stay behind.

JBI115: Some Serious Seeds!

Many people enjoy bird watching but don't always know the best type of seed for the birds in the Pittsburgh area. My experiment investigated the preferred type of seed for birds in Western Pennsylvania. To do this, I measured the amount of safflower and sunflower seeds birds ate over a period of three days. My hypothesis was proven incorrect as the birds preferred the safflower seeds to the sunflower seeds

JBI116: Allergies in Families

This is a study of the heritability of peanut allergies, versus tree nut allergies. I hypothesized that tree nuts would be more heritable because there are more allergens for tree nuts than peanuts. I conclude from my data, that the heritability is about the same, but the environment has a larger effect on peanut allergies than tree nut allergies. But because the statistical error is so large, because of the small amount of people I could survey, I could not be confident in my result.

JBI117: Dirty or not Dirty? That is the question . . .

In my project, I swabbed the school water fountains and applied them to petri dishes that were placed in an incubator. Each day for a week, I measured the growth of bacteria and compared it between the three fountains to figure which one was the dirtiest. I then regrew bacteria from the dirtiest water fountain but added three different soaps to the petri dishes and placed them in the incubator. For four days, I measured the growth of bacteria in each petri dish to determine which soap killed the most bacteria.

JBI118: Soda Pop Teeth

The procedures were to gather materials, put on gloves and goggles, take a picture of each tooth to compare before/after pictures, set up the test tubes, pour the liquids into the test tubes. Next, label the test tubes. Next, insert the teeth into the test tubes using tweezers. A lot of people drink soda, but in reality soda is terrible for your teeth. I hypothesize that after five days the teeth will be destroyed, discolored and cracked. My hypothesis was confirmed to be correct by both my research and results.

JBI119: So you can eat off the floor?

This project was to see if it was safe to eat off the ground and to test which surface in the cafeteria was dirtiest. I hypothesized that the bacteria would transfer to the food in two to five seconds. The surface samples did grow (though the "five second" half did not), so I concluded, that the floor is the dirtiest, which supported my hypothesis about the ground being the dirtiest. Since the five second rule data did not show much, I can conclude that my food choice or sampling technique may not have been adequate for testing this question.

JBI120: Golden Fish

During this experiment, Golden Fish, nine goldfish were fed three types of fish food. The goldfish's activity level was checked and measured for a minute twice a day for a ten day period. The data showed that the fish fed Aqueon fish food showed the highest activity level.

JBI121: Fingerprints in Families

I did some research on different fingerprint types, genetics, and heredity, and I hypothesized that fingerprint patterns were more common in families as compared to people who were unrelated. I gave eight families packets and ink pads and every participating person in the family got fingerprinted. I put each family into a bunch of unrelated and 50% related pairs and compared the fingerprints to see if they matched. There were 22% more matches with the 50% related pairs than the unrelated pairs, so I can conclude that my hypothesis was correct.

JBI122: Stressed Out

On your mark...get set...GO! Competitive races can be stressful. My project measures the stress caused by running races with other competitors. I used a Fitbit to record my heart rate when running in competitive cross country races and then again when running the same courses on my own. I found that my heart rate was higher when running in the competitive races, averaging 144.67 bpm compared to an average heart rate of 134.33 bpm when running on my own. I determined that the stress of running with other competitors does increase heart rate.

JBI123: The Blubber Theory

I was interested in learning more about how penguins survive in harsh climates without shelter and warm temperatures. I began by researching penguin blubber and the impact it has on their lives. My report will share many detailed facts and explanations that I learned through my experimentation.

JBI124: The Effects of Light Frequency on the SODIS Procedure

I researched if light frequencies other than ultraviolet could treat water using the SODIS method. I hypothesized that ultraviolet light would work best, however infrared would work as well, due to the fact that its heat was enough to kill pathogens. Visible light, however, would not treat contaminated water. My results showed that both ultraviolet and visible light in fact grew more bacteria than non-treated water did (I was unable to test infrared.) My results showed that treated water was more contaminated than non-treated water, due to a controlling mistake on my part.

JBI125: Achoo

I did this project because I wanted to see how much people and others are affected by the transmission of germs, as in the spread of the common cold virus. I heard that sneezes can be up to 100 mph and can travel up to 10 feet away. I wanted to see if covering your mouth while sneezing affects the spread of germs. I put a numbered amount of confetti in a balloon and then marked the ground with a tape measure starting from a baseline 00.00 outwards, measuring 4 rings 30.5 cm apart, with the last and furthest circle measuring 122cm from the baseline. Standing on the baseline, I put the balloon centimeters away from my face, 114 cm from the floor and popped it with a pin to mimic a sneeze. I recorded how many pieces of confetti landed in each ring. For the second test, I simulated covering my mouth by angling my body and balloon. My results found that without covering my mouth, germs travel very far, up to 122 cm away. Covering my mouth kept the confetti pieces closer to me and the baseline, only up to 60 cm away. Meaning that without proper care, germs can spread much further than I had expected. My results will give me many other ideas for future experiments. What I learned from this experiment is that without being careful and covering your mouth, while having a mild cold, many people can be affected even if they are not close by me when I sneeze.

JBI126: The Antibacterial Possibilities of Essential Oils

Please visit student's exhibit.

JBI127: Colored Light and Chlorophyll

My project was exploring how exposure to a single color of light affects the color of a leaf. I hypothesized that plants with a blue filter on their leaves would be greener than those with a red filter (plants absorb less energy from red light). I made filters from rectangles of colored plastic stapled to rectangles of window screen, to allow air to get to the stomata. Every 5 days, I took the filters off and photographed each leaf. In the end, the leaves did not change in color very much, so I concluded that my hypothesis was incorrect.

JBI128: Think Before You Drink

The purpose of my experiment was to find which drink threatens a tooth the most. The procedures used included filling three 237 millimeter glass jars with Coca Cola, Gatorade, and distilled water. I then dropped a tooth in each of the liquids. I observed the teeth every 24 hours for five days. My data showed that the Coca completely discolored the tooth soaked in it and made a small hole in it. The Gatorade discolored half of the tooth in it and fractured it. The distilled water showed no visible decay. My hypothesis was proven correct.

JBI129: I See Colors!

The purpose of this experiment is to find out how plant pigments can be separated. Grind leaves with mortar and pestle; let sit in acetone for 24hours. Make 2cm mark above filter paper bottom. Place 5mL of solution onto middle of origin. Fill jar with 30mL of acetone. Place paper in jar to sit until acetone is near solvent front. After drying, calculate Rf of each plant. Test 3 samples of 3 different plants. Find average Rf of each plant. The succulent, and iceberg leaves were polar, but the spinach leaves were nonpolar.

JBI300: Effect of Aloe on Fruit Decomposition

This experiment examined which fruit, strawberries, blueberries, or blackberries would develop less mold when aloe juice was poured on the fruit. Not only can mold cause health problems, but it also damages expensive fruits. We wanted to see if different berries got moldy when exposed to a teaspoon of water or aloe juice. We poured one teaspoon of each liquid onto the different fruit plates. Each evening we observed the plates. At the end of one week, the strawberries of both liquids got moldy. The hypothesis that aloe juice on strawberries would take the longest to mold was incorrect.

Chemistry (JCH)

JCH100: Bath Bomb Blast

The purpose of my science experiment is to figure out which changed ingredient will affect the chemical reaction of the bath bomb the most. I think adding more citric acid will increase the reaction the most because citric acid has a stronger reaction with baking soda and water. I will create different bath bombs changing only one ingredient at a time. I will then measure the height of the reaction in centimeters determining how much of an increase or decrease there was compared to the original. My final results can be found on the date of the science fair.

JCH101: Diet coke and candy eruption

Please visit student's exhibit.

JCH102: Beat the Heat

The purpose of the Beat the Heat experiment was to find out which type of wood burns the hottest. Gather pieces of wood and cut them to the same dimensions. The wood was placed into the rocket stove with an accelerant, and lit with a propane torch. A pot of water on the stove was tested for temperature every minute for twenty minutes. The data showed that certain woods brought the temperature of the water much higher and more quickly. Pine was the coolest burning wood. Locust and pine were really close, but locust burned the hottest.

JCH103: Cooking with Sunshine

Can you cook with the help of the sun? Based on the heat from the sun and many solar oven products, I do believe you can cook using sunshine. I decided to make my solar oven to try. First, I took a pizza box and lined the bottom of it with black foam board, then insulated each side with a roll of newspaper. I did cut a flap window on the top and covered it with foil to reflect the sun. After warming up the oven in the sun for about an hour, I then placed a bowl of water, 145 degrees, inside the oven and monitored the temperature for a few hours. In my experiment, the water barely got warmer. The sun definitely warmed up the oven but not enough to directly change the temperature.

JCH104: Accelerating Rust

The purpose of this experiment is to see which steel wool rusts most in four different liquids. Cut each steel wool to the same dimensions. Then pour the same amount of liquid into the same size container. Measure the amount of rust on each of the steel wool every five days for fifteen days. The data from this experiment is how much rust formed on each of the steel wool from each different liquid by measuring with surface area. Each of the steel wool should have different amounts of rust. In conclusion the steel wool should rust at different rates.

JCH105: Are there different levels of carbonation in different sodas?

The purpose of my study id to give people accurate information about how much carbonation is in different sodas. Hypothesis: There will be different levels of carbonation in different sodas. Procedures: 1. Weigh sodas before they are opened. 2. Record the sodas weight. 3. Open sodas and leave out for 24 hours. 4. Weigh sodas again. 5. Record sodas weight. 6. Then subtract the original weight of the sodas from the weight after it was opened and left out.

JCH106: Quick Wax

In the Quick Wax investigation the question was: Which candle material burns faster: soy, beeswax, or paraffin. All of the candles will burn until all wax is melted and the wick is burned out. The soy candle burned at an average time of 211.40 minutes. The beeswax candle burned at an average time of 165.4 minutes. The paraffin candle burned an average time 151.2 minutes. The data proved that the soy candle burned the longest, the beeswax burned the second longest and the paraffin the fastest.

JCH107: Absorption of Dyes on Plastics

Plastics are killing birds, fish, and other wildlife at an alarming rate. Recent studies have shown that birds are eating the plastics because they absorb chemicals produced by sea life, causing them to smell like a food source. Bottle caps are particularly problematic because they cannot be recycled. In order to address this situation, I proposed making bottle caps that don't absorb the smell. I put various types of plastics in water containing a water soluble dye. Color change was measured by importing pictures into Photoshop and comparing before and after dye exposure. The type of plastic that absorbs the least dye, as measured by change in color, is the least absorbent. Assuming the dye mimics chemicals produced by sea life, the least absorbent plastic would be the best candidate to make bottle caps.

JCH108: Marble Races in Corn Syrup

I was faced with an interesting question, does the heat of a liquid change its viscosity? I measured the amount of time it took the marble to travel through corn syrup in a graduated cylinder at both room temperature (25.9°C) and heated (46.7°C). At room temperature, it took an average of 2.22 seconds. When heated, it took an average of 0.38 seconds. My conclusion is that when a liquid gets heated it becomes less viscous.

JCH109: The Fizz Factor Carbon Dioxide

Some people don't like a lot of fizz in their soda when they drink it because they don't like the texture in their mouth, and usually after you drink it you might burp, and when you burp it stings your nose. So this experiment is to see how much carbon dioxide (fizz) is in soda, so my project might help. To do this I got 6 different kinds of soda and balloons, and I put sea salt in the balloons and measured the circumference of the balloon. When I was finished my hypothesis because I predicted that Pepsi would have the most carbonation.

JCH110: Growing Rock Candy Crystals

Purpose Statement: What is the effect of seed crystals on the growth rate of rock candy? Hypothesis: I think that the presence of seed crystals will accelerate the growth rate of the rock candy because they will serve as a starting point for the crystals to grow. As the water evaporates, the solution will become more saturated and the sugar molecules will collect on the seed crystals on the string at a faster rate than the unseeded string.

JCH111: Do Different Substances Cause Metal to Rust Less?

Please visit student's exhibit.

JCH112: Chillin' in the Sun

The question of my project is which fabric color absorbs the most heat in the sun? I hypothesize that the black fabric will absorb the most heat because that is what I have always been told. When I did my project, I first had to cut the four different fabric colors into 12.7cm pieces. Second, I filled containers with water and froze them overnight in the freezer. Third, I weighted each container to make sure they are the same size and recorded the weights. Fourth, I put the fabric squares on each ice container and placed them on the cookie sheet out in the sun. Next, after 15 minutes in the sun I drained the melted water from each container and weighed the containers. Last, I repeated steps 4-9 for 2 more trials. In my project, the black fabric absorbed the most heat, so my hypothesis was correct. This project was very interesting, and I would recommend this project to anyone who likes to do experiments.

JCH113: A Penny Cleaned is a Penny Earned

The purpose of this experiment is to see what removes tarnish most effectively from pennies. My procedure was to clean twelve pennies with Coke, orange juice, toothpaste, and Windex. I devised a scale to judge the outcomes. I found that cleaning with orange juice produced a penny that scored best in dullness, copper oxide, and stains. I learned that you can use household items to create chemical reactions. Future research might investigate whether you would get similar results with different types of coins.

JCH114: Fantastic Foamy Fountain

For my project, I picked elephant toothpaste because it looked like a good opportunity to see what hydrogen peroxide worked the best. I made a chart to show what reactions were for the 3%, 6%, and 12% hydrogen peroxide and I saw that the 12% hydrogen peroxide worked the best, and the 3% hydrogen peroxide worked the least. In addition, how I did that was mixing yeast, warm water, dish soap, food coloring, and the hydrogen peroxide. This is how I did my elephant toothpaste project. I hope you enjoyed.

JCH115: Better Butter Batter

Chocolate Chip Cookies are one of the most commonly baked cookies. Butter is one of the main ingredients added when baking cookies. Without butter, cookies wouldn't have the same texture. In this project, I have experimented with temperature of butter. The temperature of butter affects the height of the cookie. Butter was added at 3 temperatures; melted, frozen and room temperature. The different temperatures of butter were added in accordance with the recipe. The baked cookies' height was measured and analyzed. I determined that room temperature butter baked the cookie with the tallest height.

JCH116: Ice Melts

The experiment I conducted was what makes ice melt the fastest? I conducted this experiment over three trials. I timed how long each substance (sugar, rock salt, table salt, and sand) took to melt ice cubes. In my results I found that rock salt melts ice in the fastest amount of time.

JCH117: How Do Ingredients Impact Polymer Hardness and Consistency?

Different recipes for polymers include the use of either salt or sugar. These different recipes will be evaluated to determine their impact on polymer hardness and smoothness.

JCH118: In God We Trust, Without Spray We Rust

The purpose of my project is to determine if spray paints can prevent steel from rusting, and if so to find what spray-on protective coating best prevents steel from rusting. Carbon steel coupons were prepared by cutting a sheet of metal in one inch squares and spraying with two coats of spray paint. Three spray paints were tested. Chip resistance and corrosion tests were carried out and coupons were rated on a scale of 1 to 10. Rust-Oleum Protective Enamel resisted chipping the best. Rust-Oleum High Performance Enamel resisted corrosion the best, closely followed by Rust-Oleum Protective.

JCH119: What Size Alka Seltzer Dissolves the Fastest

The purpose of my experiment was to find out which size Alka Seltzer tablet reacts the quickest in the two ounces of water. So, I began an experiment to find this out. First, in my experiment I needed to break one tablet into halves and another into quarters, crushed the third and left the fourth whole. Next I dropped each into two ounces of water. I learned that the crushed tablet would react quickest which proved my hypothesis correct.

JCH120: Does Adding Salt to Pasta Make it Cook Faster?

The purpose of my experiment is to see if adding salt to pasta makes it cook faster. To conduct the experiment, I will use two of the same pots, salt, two food thermometers, pasta, water, and two slotted spoons. I will observe which pasta cooks faster and record my time. My hypothesis is that when the salt is added, the boiling point will be raised by the salt and cause the water to take longer to boil but cook the pasta faster due to the water temperature being higher. The final results will be available on the Science Fair day.

JCH121: What the Fizz?

The purpose of my experiment was to find out if I should use more or less citric acid in my bath bombs. This is an expensive ingredient but an important one because it reacts with the baking soda to make a fizz. I thought that my bathbombs would be just as fizzy if there was less citric acid than baking soda and set out to prove that this is true. I tested three different ratios of baking soda to citric acid in their reaction strength and length of reaction time. I found that when comparing the three mixtures, the strongest reaction occurred in each within the first thirty seconds to a minute. After this first minute, the difference between the mixtures was more evident. The less citric acid and more baking soda proved a strong initial reaction, and reacted evenly over the following minutes. The equal mixture and the mixture with more citric acid both started out strong, but had clumps which seemed to make the mixtures die out and have less fizz. In conclusion, it seems that because it takes 3 baking soda molecules to react with one citric acid molecule in order to form CO₂, the 2 to one ratio of baking soda to citric acid works out the best.

JCH122: Mixing Polymers

The purpose of my project is to see which slime polymer is the bounciest. I was inspired by this because my friends and I are always trying to make bouncy slime. My hypothesis is that the slime made with borax and glue would be the bounciest. I measured the bounce for each type of slime and recorded my results. The results will be available at the fair.

JCH123: Corrosion: Pb in drinking water

This study aims to consider how pH affects the release of lead in water and how chemistry can be used to keep water safe to drink. Experiments were designed to first study the influence of pH on lead dissolution. It was found that under acidic conditions (pH <7), higher levels of lead were measured over time compared to basic conditions (pH >7). In our second set of experiments, protective chemicals (calcium carbonate or orthophosphate) were added to the acidic water (pH <5). Measurements determined that the additives protected the metal preventing lead dissolution.

JCH124: Will CocaCola have more carbonation in a can or plastic bottle?

My hypothesis is that the plastic bottle will have more carbonation than the can. The purpose of this study was to determine if a consumer wants a coke with more fizz or less fizz. Also if there is a time difference to drink the same amount of beverage from different containers. My procedure is as follows: 1. I will shake the can or bottle. 2. Open the container and pour the contents into a measuring container. 3. Measure the carbonation. I will then collect and measure how much carbonation is in the container and draw conclusions.

JCH300: Do White Candles Burn Faster Than Colored Ones?

To determine if white vs. colored candles burn faster, the experiment will involve burning multiple candles to determine if the hypothesis that colored burn longer than white is correct.

JCH301: Natural and artificial sweeteners in coffee and their effect on staining of teeth

We conducted an experiment to see if coffee would stain the teeth. This was a qualitative experiment. We used eggshells and tile because they have a resemblance to teeth, because we couldn't get actual teeth. We put half of an egg and a piece of tile in a cup of coffee, then added sugar (Independent), or the sweetener, Splenda (Independent), to the coffee. We let it sit for 12 hours. The stains (Dependent) looked similar, even with the different types of sugar. This experiment shows that if you drink too much coffee, it will stain and break down your teeth.

JCH302: Indicator Juice

We were researching if vegetables that are not purple could be a pH indicator. All plants that can be pH indicators are red or purple. Our hypothesis was that other plants could not be pH indicators since they would not contain anthocyanins, the chemicals which made a vegetable/fruit a pH indicator. We blended some fruits and vegetables and put one ounce of that juice into 10 cups and we added liquids to each one to see if they could be pH indicators. Our hypothesis was correct because the fruits and vegetables did not act as pH indicators.

Physical Sciences & Engineering (JPE)

JPE100: Cell Phone Radiation

I researched the amount of radiation cell phones emit, and ways to reduce that. I hypothesized that the radiation would decrease as the distance between the phone and the Radio Frequency (RF) meter increases, and that aluminum foil would reduce the radiation. Using an RF meter, I measured the amount of radiation from three iPhones. I measured the radiation from different distances, and under certain parameters such as Wifi on/off and bluetooth on/off. The radiation decreased as the distance between the meter and phone grew. The aluminum foil did significantly reduce the amount of radiation, confirming my hypothesis.

JPE101: Veggie Power

Our world is being destroyed by greenhouse gasses. My experiment provides us with a new, renewable source of green energy. My goal was to find out how long water, lemons, and potato-tatoes power a small light. I tested each food by linking three of each with zinc and copper plates to form a circuit. I collected my data by watching the light bulb for twenty minutes or until it extinguished. I set an arbitrary time for 20 minutes, and every single test powered the circuit up to that time.

JPE102: Stay Tuned...

My purpose for me doing this project is to see how the position of a radio antenna affects the signal from the radio station. My hypothesis is I believe the radio signal will be stronger if my antenna is parallel to the radio station antenna. To test this I placed my antenna north to south of the radio antenna and then moved it west to east. My conclusion is that for the two radio stations I was able to pick up, the radio signal was stronger with the antenna going from west to east.

JPE103: Wind Turbine Blade Angle on Electricity Production

Wind energy is an abundant and green power source. I tested the angle of wind turbine blades against how much electricity each angle creates. I built a mini wind turbine from KidWind. I constructed blades. Then I connected a multimeter to the turbine to measure the electricity produced. To ensure that my blades were all at the same angle, I used a blade pitch protractor. I tested each blade angle three times so that my data was more accurate. I tested 0, 45, and 90 degree blade angles. The 45 degree angle was the most effective at energy production.

JPE104: Does PSI and Playing Surface Affect the Bounce of a Basketball?

My experiment was to determine the effects of PSI and playing surfaces on the bounce of the basketball. The NBA recommends a psi between 7.5 and 8.5 for a basketball. I tested the bounce at 6, 8, and 9 psi at different drop heights and different playing surfaces. I measured the bounce in each condition and averaged the bounced height for my results. The best bounce for dribbling was at 8 psi for both playing surfaces. My coach told me an easy way to check the psi is by dropping the basketball from shoulder height and if it bounces up to hip height, then it is good for play.

JPE105: Put a Spin on Clean Energy

Do you think about renewable energy sources, like solar or wind power? I wanted to see if the surface area of a windmill blade would affect the RPM. I thought that a larger blade would create more power. I hope you find this an interesting project! To do my experiment, I made blades out of ordinary household items. I turned a fan on, and for a minute exactly, watched the graph move around. I recorded the minimum, maximum, and average RPM for you to see. Enjoy, and learn something about renewable energy around us!

JPE106: Big Brick Towers

Building towers out of toy bricks and seeing which type of brick makes the tallest tower.

JPE107: Does Temperature Affect the Elasticity of a Rubber Band?

Purpose: Determine if temperature affects the elasticity of a rubber band. Hypothesis: As the temperature increases, the elasticity of a rubber band increases. Conclusion: Final results will be available on Fair Day.

JPE108: The Invisible Grip of Magnetism

This experiment was conducted to determine if the surface area of an object influences the distance from which an object can be lifted by a permanent magnet: how much field intensity is needed to lift an object. My hypothesis was: the greater the surface area, the greater the distance the object can be lifted by the magnet. I chose five different shapes in varying sizes, keeping the mass constant. My data showed that my hypothesis was correct: the larger the surface area, the greater the distance that the magnet could lift the object.

JPE109: Magno-Flow

The purpose of my experiment is to prove how there is better chance of surviving during surgical performance by controlling blood flow. Procedure: Fill 200 ml of tap water into a burette. Measure the rate of flow of the solution for 5 times take the average. Repeat the same with salt solution Repeat the same by applying magnetic field for both tap water and salt solution. Results: Tap water without magnets 1 min 15 sec Tap Water with Magnets 1 min 3 sec Salt Solution without magnets 1 min 14 sec Salt Solution with magnets 1 min 4 sec. Conclusion: The salt solution has a smaller impact than the tap water even with magnetic field added.

JPE110: What Can We Do With Magnets?

The purpose of this project was to create free and clean energy. The project was to determine if energy could be created by the use of magnets. The procedure of this project was to verify magnets do generate their own forces against each other. Prove a generator can produce it's own electricity by manually rotating it's shaft. And drive a generator by magnetic forces. The data collected was magnets do generate their own force's against each other. If magnetic force is used to drive a generator shaft, energy will be created. And magnetic poles wrap themselves and stop motion. My conclusion is that magnets can not drive a generator due to a process known as cogging.

JPE111: Whats the best size balls

The physics of throwing a football is an art and a science. There is a certain skill level has to be present to be able to catch a football successfully. My experiment will help to prove what size ball is easiest to catch by the easiest person. to complete this experiment I threw three different sized footballs to my participants. I performed three trials throwing each size ball the same distance. My hypothesis was that the easiest ball to catch was the smallest one. After performing three trials with my participants and tallying the results of each trial I accepted my hypothesis as correct.

JPE112: How Does Flex On a Hockey Stick Affect Your Accuracy

After analyzing my test data, I came to the conclusion that the stick with the higher flex rating, the more accurate your shot will be. The data supports my original hypothesis that the stick with the highest flex rating will be the most accurate. As stated in my purpose, this is useful information to know when purchasing a new stick.

JPE113: Under Pressure

The purpose of my experiment was to see if there was a difference between a flat ball or over pumped ball rather than a regularly pumped ball. I tested a flat ball, a regularly pumped ball, and an over pumped ball. I proved my hypothesis stating that a FIFA (Federation Internationale de Football Association) regulation soccer ball went the farthest. I kicked three balls three different times and averaged the kicks to get my results. The results showed that the FIFA recommended pressure of 15.6 psi is the best pressure for the ball to get maximum distance when kicked.

JPE114: How hard is water?

What I did in this project is I took my 3 different types of water and I poured all of my waters into three different bottles. I had to make sure that all of them had the same capacity of else the project won't work. I also have to add the same amount of soap in each bottle. Then I will shake them for about 15 to 30 sec. Which bottle has the higher or lower amount of bubbles will determine which is harder or softer water.

JPE115: The Floating Train

I wanted to learn more about Maglev Trains. My hypothesis was to prove that if I added more than 5 mL of water to a 15 mL cup on top of the train, the tracks would touch. I built my Maglev Train using the Magic Bullet Train Kit. I started pushing the train with my palm with the cup empty. I added 2.5, 5, and 7.5 mL of water for four trials. I repeated the process. Through my experiment, I proved my hypothesis that more than 5 mL of water will cause the tracks to touch.

JPE116: SolveBot: The Maze Solving Robot

The goal of this project is to make a robot that will solve any maze drawn by a person on a whiteboard. I will program an Ev3 Mindstorms robot with Python programming language.

JPE117: Does it Pay to Cheat in Baseball?

This involved taking two wood bats and hitting 25 balls with each bat. I had to take one wood bat and drill a 5 inch deep hole, then fill it with cork. Then I measured the ball field to see how far each was hit. I also needed to hit the balls off the ball tee with the same speed each time. During my experiment I felt that the corked bat was lighter, and that there was a bigger vibration when I hit the ball. At the end I found that there was a 3 feet average difference between the bats. The corked bat won.

JPE118: The Magnetic Gauss Rifle

When you think of magnetic force you think of magnets holding schoolwork on the fridge or that lesson in science class about magnets attracting or repelling. The purpose of my science fair project was to see if the greater or lesser number of the Gauss Rifle magnets at different stages had an effect on the distance and velocity of the ball bearings. I hypothesized that the higher number of magnets used would make the ball bearings travel faster and further. Through tests, my hypothesis was proven correct with the magnets transferring energy and momentum to each other.

JPE119: Under Pressure

The purpose of my project was to see what p.s.i. level went the farthest in a soccer ball. Soccer players would care about this project because it will help them in practice. Using 5.5 p.s.i level had an average of 106.33 inches, 7.5 p.s.i level had an average of 101.89 inches, and 9.5 p.s.i level had an average of 82.5 inches. The 5.5 p.s.i level went 106.33 inches. When you kick a soft ball the energy is lost from the soft surface.

JPE120: Compression of materials to simulate building foundations

In my experiment I was comparing how different materials compress under the weight of a cinder block. My experiment went fairly smoothly except for not being able to get all the material I wanted at first. The materials I compressed were dirt, sand, and pebbles as well as mixtures of these materials. I compressed these materials with one cinder block and measured the compression in centimeters compressed from the original height. I was not surprised by the results the softer materials compressed more than the pebbles. My prediction was somewhat correct.

JPE121: Physics of a Water Bottle flip

Purpose: To determine whether a $\frac{1}{3}$, $\frac{1}{2}$, or full water bottle is more likely to land upright when flipped. Procedure: Fill three disposable plastic bottles to 167 ml ($\frac{1}{3}$ full), 250 ml ($\frac{1}{2}$ full), and 500 ml (unopened). Flip each bottle 120 times. Calculate how often each bottle lands upright. Data: A bottle $\frac{1}{3}$ full landed upright about 35% of the time; a bottle $\frac{1}{2}$ full landed upright about 23% of the time; and an unopened bottle landed upright 0.08% of the time. Conclusion: A bottle $\frac{1}{3}$ full of water is the most likely to land upright when flipped.

JPE122: Does the Amount of Carbon In Steel Affect the Strength of a Magnet?

Purpose: Do different carbon amounts affect the strength of a steel magnet? Hypothesis: As the amount of carbon in a magnet increases, the magnetic force will decrease. Conclusion: Final results available at fair

JPE123: Can the Shape of a Window Be Used To Increase the Temperature Inside a House?

Purpose: Determine if the shape of windows in a house can increase temperature. Hypothesis: The temperature inside a model house will increase if convex shaped windows are used. Conclusion: Final Results available at fair.

JPE124: Magnetic Shielding and Maglev Trains

Magnetic levitation (maglev) trains are emitting radiation that can potentially become harmful to nearby citizens. My project revolved around this topic. An EMF detector measured the amount of radiation produced from the electromagnets, and a product called Magnetic Shielding Foil was applied on the vehicle in attempt to reduce the radiation. Thorough analysis revealed that optimal placement of the foil (applicable to a real world situation) could be placed on the inside of the train, directly above the train magnets. As a follow-up, I may delve into testing with a larger maglev train to improve the accuracy of the testing.

JPE125: How rocks absorb heat in the microwave

I put rocks in the microwave for one minute and see which one absorbs the most heat

JPE126: How Can We Protect Ourselves from Radiation?

The purpose of this project is to improve the safety of cell phone use to the human user by adding to knowledge about radiation emitted from an iPhone. I will use a radiofrequencymeter to evaluate an iphone configured with and without bluetooth and cases.

JPE127: Does the Depth of the Pocket on a Lacrosse Stick Affect the Amount of Force a Lacrosse Ball Is Thrown?

Purpose:Determine if the depth of the pocket on a lacrosse stick affects the force and velocity of a lacrosse ball. Hypothesis:As the depth of the pocket increases the amount of force applied to a lacrosse ball will decrease. Conclusion Final results available at fair.

JPE128: Homemade Batteries

The goal of this project is to determine the best, most powerful battery from materials found in the average home. Batteries constructed from metals and fruits will be compared with a voltmeter.

JPE129: Take Flight To The Green

Titleist Pro V1 golf balls offer unmatched distance and short game performance. Some believe that only skilled golfers realize Pro V1s' benefits. Subjects of varying skill levels tested Pro V1s and range balls at a distance of 18.3 meters from the flag. Each subject used a Callaway Mack Daddy 56 degree milled wedge. Subjects were permitted to "warm-up" equally. Then subjects took 10 shots with used range balls and 10 with used Pro V1s. The distance from the flag of each ball remaining on the green was measured and recorded. The Pro V1s outperformed the range balls for all golfers.

JPE130: Will You Bank the Shot?

Some people think it is not important to know What the best angle is to bank the shot but it is. My project tested different angles to bank the shot. I tested a 90, 30, and 60-degree angle. I made a scale model so, I had to find the different measurements between the real game dimensions and my scale model. Then, I made my scale model and did the experiment. In the experiment, I got a paper towel role and got a test ball to do the project. My results were that the best angle to bank the shot is the 90-degree angle.

JPE131: Making Power Out of Fruits and Vegetables

My project started out with just potatoes, but then it ended up a competition. The first thing I intended to do was test a potato itself and see if it would generate power. After that, I decided to take two other foods and see which one worked better. I tested two of each food connected together. On the clock it was too much power but for the LED it was good. Then I tested just one of each and the clock worked well as long as you didn't turn on the night-light and the LED worked a little.

JPE132: How does weight attached to the motor affect the robot's movement?

This experiment, Building an Art Bot, was done to determine if weight affects movement. By building an Art Bot, which created art by movement, one could visually see the changes in movement. To do this, one has to build an Art Bot with a plastic or paper cup, a motor, a battery, a circuit and markers. After building the robot, the robot was put on poster board 3 different times. Each time the weight was moved to see how this affected movement after 10 seconds. It was determined that using a heavier cup helps stabilize the Art Bot. This allowed for the Art Bot to create more art.

JPE133: How different ground effects a basketballs bounce hieght

Basketball is one of the most popular sports in the country. without using the typical indoor basketball court, my experiment will test how a basketball will bounce the highest using different surfaces. These surfaces include Concrete, Grass, and Gravel. The height that will drop the ball is 0.9144 meters. If I drop the ball on different surfaces it will bounce at different heights and the ball will bounce the highest on concrete. I proceeded with my experiment and my hypothesis confirms that when dropping a ball on concrete, grass, and gravel it will bounce the highest on concrete.

JPE134: Wind Turbine Blade Size Affects Energy Output

Purpose: Make a wind turbine, two blades and run experiments. To determine which blade would pull more weight (energy). Procedure: Build a model wind turbine , test different blades and document the results. Data: The longer blade was able to lift 0.4 - 1.3 ounces. It couldn't lift 1.4 ounces. The shorter blade was able to lift 0.2 ounces, but unable to lift 0.4 ounces. Conclusion: The longer blade was able to pull more weight . The 6" x 2" blade was able to pull up 1.3 ounces verse the 4" x 3" blade pulling 0.2 ounces.

JPE135: Applications of Solar Power via Photosynthesis

Artificial photosynthesis can be more efficient than current power sources. The materials used to produce artificial photosynthesis are less expensive than solar panels and fossil fuel technologies. In my project, I am designing and constructing a model of an artificial photosynthesis panel (artificial leaf) and measuring voltage. The data collection will include a measurement of actual voltage and cost analysis of current power production versus proposed artificial photosynthesis power production. Next I will conduct a comparison of other energy power sources to artificial photosynthesis. The final results will be available at my exhibit on fair day.

JPE136: Thermal Insulation over Time

I researched which material/structure would be the best insulator of cold liquid: plastic, glass, or metal. Although metal is a poor insulator, I hypothesized the 2-ply metal would be the best insulator because space between plies reduces heat transfer. I set up 5 containers with lids, 1-ply plastic, 2-ply plastic, 1-ply metal, 2-ply metal, and an open glass control container. I put 473 mL of 0°C water into each container, controlling room temperature and minutes of lid removal. Temperature was measured every 30 minutes for 6 hours. Results: 2-ply metal maintained chilled temperature for longer, confirming my hypothesis.

JPE137: Aqua Filter: The Green Way

I did this experiment to determine which substances can filter out dirty water. Most water in the world is unhygienic. Under a microscope, activated charcoal has millions of tiny pores that filter out the water and cleans it. To start, put 5 cotton balls into each soda bottle. Then put activated charcoal, regular charcoal, and coffee filters in the bottles. Next, put sand and gravel into all the bottles. Next, make the dirty water -use food coloring. When finished, I put the water into the water filters. Do this 2 times. Next time I will uses different materials for this.

JPE138: The 'Patriots' affect - Does air pressure in soccer ball affect the game?

In 2015 AFC championship, Patriots win was controversial, as it was found that the football was intentionally deflated. As I play soccer, it made me wonder how does the pressure in soccer ball impacts the game – in the distance it can travel and also in case of penalty shot. My hypothesis was that the soccer ball with higher air pressure (PSI) would travel further meaning will have higher velocity. I test this in three levels of air pressure – below the PSI recommended by the manufacturer, at the recommended PSI and above recommended air pressure.

JPE139: Flying Sparks

The purpose of this experiment is to determine electrical arc distance with varying humidity and air pressure. Sparks were created at pressures between atmospheric and 70 kPa and the arc distance was measured at each 10 kPa increment. Next, the humidity level was varied instead of pressure. My hypothesis was that increases in pressure or humidity would allow the sparks to jump farther. The data proved my hypothesis incorrect as increases in pressure resulted in shorter distances. In conclusion, my hypothesis was proved to be incorrect – increases in humidity or pressure causes the distance that sparks can jump to decrease.

JPE140: Warning, Warning, RN is Here!

Fans under your foundation isn't ideal. Which is why I chose to my project in a more cost effective way. I had to solder together a 1k resistor. Then I had to place them inside a can with other wires. Finally, I attached a digital multimeter to it. When I was testing, if the number would increase in the digital multimeter, there would be radon. The lower elevations contained more radon gas compared to the higher elevations. The difference was about 0.025 millivolts. In my conclusion, the hypothesis turned out to be successful.

JPE141: Green Screen Investigations

I tested three different types of green paint for their usefulness as a green screen in digital editing. I varied the amount of red and blue in the paint, applied the paint to poster boards, photographed my hand in front of each boards (keeping the distance, light, and camera as constants), then used Photoshop to remove the green from each photo. I measured the amount of hue that remained at the borders of the flesh after the green was removed. I discovered the Bright Parrot Green worked the best.

JPE142: Banking on Bernoulli

This experiment set out to test how the surface finish of a ball effects the height and angle of the ball in a column of air. This experiment incorporated the use of a hair dryer, Styrofoam balls, and varying surface finishes from rough to smooth. Each set of balls was placed in a column of air and the height was measured. Then the hair dryer was tilted until the ball fell out of the air column and the angle was measured. The data showed that an increased surface finish will cause the height to increase and the angle to decrease.

JPE143: Le Saut de ballet de la 1^{ere} position

Most people think that ballet dances just jump, but there is something that helps dancers jump: it is physics. My experiment is to see why taller ballet dances tend to jump higher than shorter ballet dancers. I will design a protocol that keeps the results and the test consistent. I will take measurements of their feet, lower legs, and upper legs, as well as height/weight. Also, they will warm up. I will measure three jumps, find the average and finally asses the data. I do not have my results or conclusions, but they will be available at the science fair.

JPE144: Nothing but Net

Nothing but Net was preformed because in many basketball games on television, players miss a lot of easy shots. The physics it takes to make the shot was investigated. The procedures used were to gather materials, measure nineteen point nine feet, shoot the basketball ball, and convert the outcomes into percentages. The first shot was the advanced shot, releasing at a thirty- three degrees and putting a backspin on the ball. The second shot was a normal shot, shooting the ball with your fingertips. The outcome of this project was that shot one produced the greatest number of successful shots.

JPE145: Which Material On a Reacher Is Most Effective At Grasping Objects?

Purpose: Determine Which Material Is Most Effective At Grasping Using Reacher. Conclusion: Available at fair

JPE146: Electric Lemons

My project was how many lemons does it take to charge a phone. I thought out of two, three, or four lemons four would charge a phone the best because there is more acid. The first thing you have to do is make sure you have all the materials. Next you have to take two lemons and connect them to copper wire with alligator clips to a nail and penny then plug a charger into one of the lemons. My project ended up not working at all. If I were to do this project again, I would try a different fruit or wire.

JPE300: How Size Affects Drop Speed

We researched how the circumference of a balloon changed the time difference it would take to fall. We blew up 28 balloons in all: 14 with a circumference of 48 cm, 14 with a circumference of 38 cm, all balloons filled with 10 mL of water. We hypothesized that the time difference between the two balloons falling would be 0.5 seconds. When we finished our experiment, the time difference turned out to be 0.38 seconds, so we conclude that our hypothesis was close to the truth.

JPE301: Now You're Cooking

In our project we're trying to see what heat source will work the best. Our hypothesis is that the hair dryer will be the best heat source. In the project we used our solar oven that we made to try to cook s'mores with a hair dryer, a lamp, a laser and a mirror. When we were cooking the s'mores with the lamp we noticed that it took longer with a plate so to prove that, we tried everything on and off a plate. After cooking everything we found out that the hair dryer is the best heat source.

JPE302: Ice, Ice, Baby

The project we are doing is seeing what substances melts ice the fastest. We are using three different substances. They are salt, sugar, and sand. Our hypothesis is that sand will melt the fastest. It would be better than salt because sand is easier to get than salt. We think that sand is easier to get than salt, because there is a lot of sand at, for example, beaches.

JPE303: How Temp affects Magnets

Our project is about how temperature affects magnets. When we started this project, we both already had some interest in magnets. So, we wanted to have a project that includes them and maybe how they work. We thought about things that could affect the performance of the magnets. We came up with temperature and how it does, or does not, affect magnets and how they work.

JPE304: The Effect of Different Color Light on Solar Power

Solar power is an abundant a green form of energy. We were curious whether different colors or wavelengths of light generate more solar power than direct sunlight? Our hypothesis was that the red cellophane placed in the path of direct sunlight over a solar panel would produce the most light because red has longest wavelength. The sun almost always generated the most power, but yellow created the second most to the sunlight, the control. We think this happened because yellow was the lightest color so it let the most sun through the colored cellophane.