

Abstract: Science and Engineering Fair of Houston

1138

A Dive into Protection :Mineral vs Chemical Sunscreens

Niva Varia

Conroe ISD /Knox Junior High

Category:

Chemistry

The purpose of this experiment is to test whether mineral or chemical sunscreens are more effective, despite having the same amount of each chemical and mineral sunscreen's active ingredients. The hypothesis states that if mineral and chemical sunscreen ingredients are compared equally with one another based on protection against ultraviolet rays, then mineral sunscreen will be proven to have higher effectiveness than chemical sunscreen because it deflects UV rays instead of absorbing them. This is a very important study to test because over half of the American population wears sunscreen, but many Americans do not know the difference between mineral and chemical sunscreens. Knowing which one performs best could keep you safe and protected from common skin dangers. In this experiment, the researcher will test mineral and chemical sunscreen ingredients in a controlled setting and will place each ingredient into separate petri dishes. The petri dishes will then be set onto individual photochromic papers. The papers and dishes will be set under ultraviolet radiation for 3 minutes per trial at a set distance. Color changes in the paper results will then be graphed. The researcher will conduct this experiment three times to ensure the best accuracy. The researcher will then use graphs and data tables to compare the results from mineral to chemical sunscreen ingredients to see if the hypothesis is true. In conclusion, mineral and chemical sunscreen ingredients had no significant difference in the SPF levels. They performed the same during the experiment on the photochromic paper for all three trials. The hypothesis was not supported, and the experiment demonstrated that mineral and chemical sunscreen ingredients, when compared equally, provided the same level of protection against ultraviolet rays. This helps the scientific community better understand that sunscreen effectiveness is not solely determined by ingredient type, but by overall formulation and performance.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1139

The Effect of Coca-Cola vs. Water Deposition

Sarah Sunny

Friendswood ISD /Friendswood Junior High

Category:

Chemistry

The purpose of this experiment was to determine whether Coca-Cola causes greater decomposition or mass change in food compared to water. 5 food items: marshmallow, orange, chicken, steak and cheese were tested over a 5 day period. Each food was weighed using a digital scale to record the initial mass. One piece of each food was soaked in coca-cola and another piece in water using equal liquid volumes. The foods were observed daily and mass was recorded each day for 5 days. The marshmallow in coca -cola decreased from 6 grams on day one to 0 grams on day 5, while the marshmallow on day in water decreased from 6 grams to 3 grams. The orange in coca cola decreased from 6 grams to 29 grams, while the orange in water decreased slightly from 35 grams to 33 grams. The chicken in coca-cola from 73 grams to 83 grams, while the chicken in water began at 72 grams and ended 72 grams after fluctuating. The steak in coca cola increased from 31 grams to 33 grams, while the steak in water began and ended at 31 grams. The cheese in coca-cola decreased from 23 grams to 19 grams, while the cheese in water decreased from 23 grams to 20 grams. Overall, foods placed in coca-cola showed greater mass changes than foods placed in water. Some foods lost mass more quickly in coca-cola, while other gained mass, likely due to liquid absorption. These results show that coca-cola caused greater changes in food mass than water over time.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1140

Detergent Deter: Cleansing Our Clothes

Naya Elizondo

Alief ISD/Albright MS

Category:

Chemistry

The question I was trying to answer is “What brand of detergent cleans stains off clothes the best?”. I picked this question because I often soil my clothes while attending school, playing sports, and eating at restaurants. I believed that researching my question would inform me of the best detergent. I hypothesized that the Tide™ detergent would cleanse the cloths the best. I changed the detergent when washing the cloths, and used different condiments on the towels so I could attain an accurate conclusion of which brand cleaned the best. I recorded the cleanliness level of the towels after one wash on a scale of one to five, with five being a stubborn blemish, and repeated this process twice. The procedure begins with smearing a tablespoon of one of six condiments on 18 labeled (from 1-18) cloths (with an equal number of cloths having each of the six substances on them). Next, place the towels in a washing machine with one of the three detergents and repeat the process with the same detergent. Finally, photograph and record the results physically and digitally, and repeat all the steps twice with the other two detergent brands. The materials used were six condiments, white cloths, a washing machine, three brands of detergent, a teaspoon, a permanent marker, and a camera. I documented the data by capturing pictures of the stained cloths before and after washing and drying, and recorded the data by writing the cleanliness level of the cloths in a chart. The Tide™ cleansed the cloths of their stains the best, with an average cleanliness rating of 1.5. My results matched my hypothesis because the Tide™ had the lowest cleanliness rating. The results mean that, on average, the towels were less clean when Tide™ was not used. Improvements I could make if I re-conducted this experiment are performing more trials, testing how the amount of time the blemish sat affected the detergent's ability to clean, and finding a way to effectively wash the towels while conserving water.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1141
Color vs Heat

Sawsan Elhaidari
Private/Iman Academy Southwest

Category:
Chemistry

This experiment tested whether the color of water affects how fast it evaporates in sunlight. Equal amounts of colored water were placed in identical containers and set in the sun for the same amount of time. The remaining water was measured and compared. It is expected that darker-colored water will evaporate faster because it absorbs more heat.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1142
Water Filtration Methods(with ink)

Karthik Iyer, David Kim
Conroe ISD /McCullough Junior High

Category:
Chemistry

Our goal with this project is to try to solve a world wide crisis; unsafe and unclean water. We are going to dive into chemistry and try to investigate the properties of activated carbon and which type is better for this problem to solve. For starters, 13.2% of people don't have clean water. Our goal is to reduce that significantly by either using granular or powdered activated carbon. The way we are going to do this is by putting various amounts of ink into 9 cups with water. Then we use some types of carbon with the water to cause a chemical reaction. We filter out the carbon with paper filters and separate the water. Then, we test it by pH strips, and grade it by a scale we created. This can be used to help the real world to have clean, safe drinking water. According to the EPA, activated carbon is a crucial part in reverse osmosis, which is the last component after all the microscopic filters. In our results, we saw a massive change. In conclusion, one AC(activated carbon) was better than the other, and it is more cost-effective than microscopic filters.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1143
Homemade cleaning products

Aria Talbot
Clear Creek ISD /Brookside Intermediate School

Category:
Chemistry

The purpose of this experiment was to investigate how different types of homemade stain removers' effect in the appearance of the stain after treated. The hypothesis was that stains treated with an acid and base mixture would show the most significant difference from the control that had not been treated. There were 70 different samples all stained the same and then they were separated into groups of 10, then one group was treated with just warm water, one group was treated with isopropyl alcohol, one group was treated with vinegar and backing soda, one group was treated with just vinegar, one group was treated with lemon juice and backing soda, and the last group was treated with just lemon juice. Results showed that isopropyl alcohol was the most effective of the ink stain while the vinegar and baking soda was the most effective for the lipstick stain, while the vinegar by itself was not effective at all. This shows that the hypothesis was partly correct, because a mixture with a base and acid was the most effective for the lip stick stain but it was not the most effective for the ink stain.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1144

Oxygen from Electricity: Bioelectric Hydrogels for Healing

Ashvin Ghanta, Avighna Ghanta

Private/The Emery/Weiner School

Category:

Chemistry

Purpose: Hydrogels are materials made of polymers and water that are used in many medical applications. When electricity is applied through a process called electrolysis, hydrogels can produce oxygen, which may be useful for wound healing. The purpose of this experiment was to test how different additives affect oxygen production during electrolysis in alginate hydrogels. Our hypothesis is that using Epsom salt will generate the most oxygen because it adds charged particles to the water, allowing electricity to flow more easily. Methods: Alginate hydrogels were created by mixing 20 mL of 2% sodium alginate with 20 mL of 2% calcium lactate. Each hydrogel contained one of the following additives (2 g): no additive (control), vinegar, baking soda, or Epsom salt. The hydrogels were placed in an electrolysis chamber and connected to an 11.5-volt power supply. Oxygen gas produced at the anode was measured every 5 minutes for 20 minutes using water displacement in an inverted graduated cylinder. Three trials were performed for each group. Results: All groups produced gas during electrolysis. The Epsom salt hydrogel produced the most oxygen (3.4 mL), followed by baking soda (2.3 mL). The vinegar (0.5 mL) and control (0.4 mL) groups produced the least oxygen. Conclusion: Electrolyte additives increased oxygen production in alginate hydrogels, with Epsom salt being the most effective. These bioelectric hydrogels may have future medical applications, such as smart bandages for wound healing.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1145

The Hard Facts About Soft Water

Triston Dawson, Bailey Nguyen

Alief ISD/Alief MS

Category:

Chemistry

Out of the research we did, we found out that water hardness isn't the worse thing, but it can be very annoying as you might need to clean more, and it could make washing a lot harder, and from our locations we used, we found out that many places around Houston have hard water.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1146

Biological Nitrogen Fixation vs. Nitrogen Fertilizers: Effects on Plant Growth and Economic Growth

Harishankar Pitchiah, Vihaan Gadewar

Fort Bend ISD /Fort Settlement Middle School

Category:

Chemistry

We all know plants need soil, water and sunlight for growth, the other essential ingredient for growth is Nitrogen. Plants use nitrogen to make DNA in their cells and the proteins that lead to healthy stems and leaves. Nitrogen is an essential element for the evolution of life, because it is found in a variety of biologically important molecules. Although our Earth's atmosphere is made up of 78% Nitrogen, the form of Nitrogen found in the atmosphere cannot be used by plants. The plants get the Nitrogen either through Nitrogen deposits in soil, or through a friendly relationship with Nitrogen-fixing bacteria. Nitrogen-fixation happens through the Nitrogen cycle. Nitrogen cycle is essential for life because nitrogen is a key component of proteins and nucleic acid. This experiment helps us in understanding and comparing the Nitrogen gain by plants using Fertilization and Inoculation.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1147

Best Stain Remover

Janna Alrashdan, Fayrouz Elrifai, Meera Daye

Private/Houston Quran Academy - Spring - MS

Category:

Chemistry

This experiment was designed to test and compare what stain remover works best on fabric and getting rid of stains for our stain my team decided to use ketchup as our stain after a group discussion we found that our independent variable was the stain remover brand and that our dependent variable was how much the stain degrades. For our materials we kept it nice and short and we only used a number of materials which were white shirts, Oxiclean stain remover, Tide stain remover spray, Shout stain remover spray, Miss Mouth Messy Eater stain remover, ketchup, timer, measuring cup, sharpie and paper towel. Our hypothesis was that the best reviewed stain remover will work best. Our hypothesis was rejected. The issues of this experiment was not what i planned for first in our first trial I accidentally spread the ketchup too much for the Miss Mouth Messy Eaters spray which was a disaster second since one of our teammates were traveling it was hard to talk because of the time zones but overall the experiment was a good one but if you asked me to do it again i would probably say no this was probably the worst and best experience of my life in science.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1148

Glowin' With the Flow

Kaitlynn Viray

Conroe ISD /Knox Junior High

Category:

Chemistry

The problem investigated in the project was how temperature affects the brightness and duration of chemiluminescence demonstrated in glow sticks. The hypothesis states that if glow sticks are exposed to warmer temperatures, then they will glow brighter but for a shorter amount of time, rather than if glow sticks are exposed to cooler temperatures, then they will have a dimmer glow but for a longer period of time, because heat speeds up the chemiluminescent reaction and uses the energy more quickly. Glow sticks are more commonly used for emergency lighting and safety purposes, so understanding how temperature affects their performance is important for improving their efficiency in real world applications. To test this, glow sticks were used as a model for chemiluminescence and placed in three different temperatures: hot, room temperature, and cold. Each glow stick was allowed to sit in each temperature condition before being activated to ensure the chemicals inside reached the same temperature as the water. After activation, brightness was being measured using a digital lux meter at regular time intervals until the light reached a detection limit of 1 lux. Multiple trials were conducted for each temperature to ensure consistency. In conclusion, the results showed that glow sticks in hot water lasted 37 minutes, room temperature glow sticks lasted 58 minutes, and cold water glow sticks lasted 73 minutes. These results supported the hypothesis, as lower temperatures caused the glow to last longer while higher temperatures caused the glow to fade more quickly. This information can be used to improve the effectiveness of chemiluminescent products in real world applications such as emergency lighting, outdoor safety, and proper storage of glow sticks to balance brightness and duration.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1149

Corrosion in Metals

Abbas Raza

Private/AL-HADI SCHOOL OF ACCELERATIVE LEARNING

Category:

Chemistry

Corrosion in metals is an experiment that can help to reduce possible risks of damage in building materials, household products, or even day-to-day tasks. Being aware of what could possibly get corroded can help to guide people to purchase smarter or companies to build with better materials. Metals tested were copper, iron, steel, aluminum, & brass. Results showed that iron corroded the most in salt water. The other metals did not show many signs of corrosion. The future direction of this experiment will be to test corrosion using tap water and household cleaning supplies.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1150

Neutralizing Acid With Household Bases

Oleksandra Kulikova, Jintong Mao

Alief ISD/O'Donnell MS

Category:

Chemistry

The purpose of our project was to determine which common household base neutralizes an acid most effectively. We chose this project because acids and bases are found in many everyday household products, and understanding how they react can help us solve real-life problems such as cleaning acidic spills. Our goal was to learn how different bases affect the pH of an acid and which one works best. In our experiment, we used lemon juice as the acid and tested five household bases: baking soda, soap, laundry detergent, ammonia, and washing soda. For each trial, we measured 50 mL of lemon juice. For solid bases (baking soda, soap, and washing soda), we prepared liquid solutions by dissolving 10 grams of each solid in 20 mL of water. We then added 10 mL of each base to the lemon juice, stirred the mixture, and measured the final pH using a digital pH meter. We repeated each test three times and calculated the average final pH to ensure our results were reliable. Our data showed that all of the bases increased the pH of the lemon juice, but washing soda was the most effective, producing the highest average final pH of 4.81. Baking soda increased the pH to 3.53, while ammonia, laundry detergent, and soap were less effective. These results supported our hypothesis that washing soda would neutralize the acid most effectively. In conclusion, our experiment demonstrated that different household bases vary in their ability to neutralize acids. Washing soda was the strongest base tested in our experiment, and what we learned can help us better understand acid-base reactions and make informed choices when using household products.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1151

Ink Forgery Detection

Mia Lira

Conroe ISD /Knox Junior High

Category:

Chemistry

The purpose of this experiment is to determine which solvent is most effective for separating ink dyes in black pens using paper chromatography. The hypothesis states that acetone will separate the ink dyes the best because it dissolves ink dyes better than other solvents like water, vinegar, or alcohol, allowing the pigments to separate more clearly and making ink differences easier to identify. In this experiment, the scientist performed paper chromatography on 2 different black pens with 5 different solvents. Each pen's ink was spotted onto the chromatography paper, and the paper was then placed in the solvents to allow the dyes to separate. Then the R_f values were calculated by dividing the distance traveled by each dye by the distance traveled by the solvent front. In conclusion, the results showed that water and ethyl alcohol produced intermediate and differing R_f values between the two pens, making them the most effective solvents for distinguishing inks. Although no solvent produced ideal separation, a mixture of water and ethyl alcohol could potentially improve separation by creating an intermediate polarity. These results reflect how scientists optimize solvents in forensic analysis and demonstrate that paper chromatography can serve as a quick and cost-effective preliminary method for ink forgery detection. The hypothesis was not supported because acetone was not the most effective solvent, giving inconsistent results.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1152

Cooking Away the Danger: Deactivating Phytohemagglutinin in Kidney Beans

Peter Zwart

Clear Creek ISD /Westbrook Intermediate School

Category:

Chemistry

Kidney beans contain phytohemagglutinin (PHA), a naturally occurring lectin that can cause severe health issues (potential chance of death) in insufficiently cooked kidney beans. This project investigates how boiling time affects the biological activity of PHA, aiming to identify the minimum cooking duration required before kidney beans become safe for eating. Beans were boiled at intervals ranging from 0 to 20 minutes, and PHA activity was assessed using an indirect measurement, by using cress seeds. My conclusions showed the you must boil the kidney beans for a minimum of 20 minutes for the toxin to be destroyed.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1153

What liquid would make a penny corrode the fastest(white vinegar, apple cider vinegar, cola, and lemon juice)

Phuttharaksa Melchor

Houston ISD/BCM Biotech Academy at Rusk - MS

Category:

Chemistry

The purpose for my science fair project is to see which liquid would make a coin corrode the fastest in 60 minutes. If my research or experiment goes well this could help to create a tool that could help clean metals easier and what would make it more harder to clean with. I tested different liquids and found that the corrosion differed even after only thirty minutes. This shows which substances are the most damaging to the metals, and which are not.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1154
Spot The Different Stains

Elizabeth Liera
Alief ISD/Albright MS

Category:
Chemistry

How does different type of drinks affects chicken bones. I chose this question because I was curious of how different drinks can affect your teeth. I thought that Coca-Cola will damage the teeth (Chicken bones) more because it has a lot acid and sugar. My independent variable was the different types if drinks and my dependent variable is what stains the chicken bone more. What I change in my independent was adding no sugar in the coffee to see what will happen, and I saw that the stains for each chicken bone was noticeable. I used 8 oz. of tea, coffee, cranberry juice, water, and coffee, and I also had five chicken bone and five cups. I poured each cup with each different drinks and I put the chicken bones in each of them. I recorded my data by using my phone. We compared results by using a chart. I found out that coffee stain the chicken bone a lot then the Coca-Cola. No my prediction is wrong because I thought Coca-Cola will stain it more but coffee stain the chicken a lot. I learned that coffee can affect your teeth a lot. I can improve this experiment by trying drinks that have a lot or the same acidity.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1155
Shimmer and Shine

Khadija Shama
Private/Iman Academy Southwest

Category:
Chemistry

This project examines which homemade cleaning solution works best to remove tarnish from silver. Several household mixtures were tested, with results showing that a white vinegar and baking soda solution was the most effective. The findings demonstrate how basic chemistry can be used to create affordable and practical cleaning solutions using everyday materials.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1156

The Science Behind the Sweets: The Effect of Different Acids on Baking Soda in Cakes.

Emily Rigoulot

Clear Creek ISD /Westbrook Intermediate School

Category:

Chemistry

My topic was the affect of different acids combined with baking soda in cakes, and I studied this because I have a passion for baking, and I often experiment in the kitchen, trying to better my craft. I have always been curious about the ways chemistry can be used in baking, and I wanted to see how I could make my cakes rise using different acids. My hypothesis that that vinegar will cause the cake to rise the most, but it will taste bitter and sour. I believe this because I know that vinegar is a very strong acid, meaning it will react to the baking powder, but it also has a very strong taste because. I carried out my experiment by baking 1 cake as the control, which has neither baking soda nor acid. Then I will bake 2 cakes with baking soda, 2 with baking soda and lemon juice, 2 with baking soda and vinegar, and 2 cakes with baking soda and cream of tartar. Finally, I will measure and compare the rise of each cake and the tastes of each cake. My project conclusions are important because it allows both home bakers and professional bakers to find ways they can better their baked goods while still keeping a safe environment. By knowing this information, bakers are able to create their own recipes that are more appealing to the market and can sell at a greater rate, allowing the baker to earn more profit. Also, by knowing how different acids affect baking soda and how it affects baked goods, home bakers can better their craft and be more knowledgeable in the art of baking.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1157

The PH power of Candy

Luqman khan

Private/Iman Academy Southwest

Category:

Chemistry

This experiment investigated whether sour candies make water more acidic than non-sour candies. Sour candies contain acids such as citric acid and malic acid, which are responsible for their sour taste. In this study, equal amounts of sour candies and non-sour candies were placed into separate containers of water. After allowing time for the candies to dissolve, the pH of each solution was measured using pH strips. The pH values were recorded and compared to determine which solution was more acidic. It is expected that the water mixed with sour candies will have a lower pH than the water mixed with non-sour candies. The results of this experiment help demonstrate how acidic substances affect pH and increase understanding of acids in everyday foods.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1158
Microplastics

Category:

Chemistry

NhyiraBa Setorglo

Clear Creek ISD /Brookside Intermediate School

Microplastics are tiny pieces of plastic that are increasingly found in the environment and in everyday products, including drinking water. Scientists have detected microplastics in both bottled water and municipal tap water, but it is still unclear which source contains more and why (Mason et al., 2018; Kosuth et al., 2018; World Health Organization [WHO], 2019). This study investigated the presence of microplastics 10 micrometers (μm) or larger in four commercially available bottled drinking water brands and compared them with unfiltered municipal tap water. Each water source was tested in three independent trials to improve accuracy. One hundred milliliters of each sample were filtered using 10 μm filter paper, and the filters were examined under a light microscope. Suspected microplastics were identified based on size, shape, and resistance to crushing. The results showed that unfiltered tap water contained the highest number of microplastics, while some bottled water brands had few or no detectable particles at this size level under the conditions of the experiment. The results did not support the original hypothesis that bottled water would contain more microplastics due to plastic packaging. Instead, the findings suggest that water source and filtration methods may play a more important role in microplastic contamination than packaging alone. This study contributes to ongoing research on drinking water quality and highlights the need for continued research on microplastics in everyday water sources.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1159

The Science Behind The Nail creation

Cristal Leon

Charter/SST - Champions College Prep - MS

Category:

Chemistry

Acrylic nails are a widely used cosmetic product that rely on chemical reactions to create a durable coating on the natural nail. This project explores the chemistry behind acrylic nails, focusing on the polymerization process that occurs when a liquid monomer reacts with a powder polymer to form a hard plastic. Polymer science is an important branch of chemistry and is used in many everyday products, including plastics, paints, and adhesives. Through research, this study explains how acrylic nails are formed and examines their real-world applications. Understanding the chemistry behind acrylic nails helps demonstrate how chemical reactions are used in daily life and highlights the importance of proper and safe use of cosmetic products.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1160

Pop and Fizz / What soda brand is the most acidic?

Kathy Huynh, Minh Le

Alief ISD/Alief MS

Category:

Chemistry

The purpose of this project is to test which soda brand is the most acidic. Why did me and my partner chose this project because we notice that the sodas we drink are a bit tangy from acidic soda. This experiment can be helpful because the acidity in soda can cause dental issues so you can switch out a more acidic soda with a soda with less acidity. Our hypothesis was, "If you test which soda brand is most acidic, then the soda with the most sugar which was Mountain Dew will be the most acidic. How me and my partner did was we had fifteen cups to test each soda brand three times. Then, we put the PH meter in each cup for 30 seconds. After recording the PH level and calculated the average. However, our results did not support our hypothesis with Mountain Dew being the most acidic. Rather, Pepsi was our most acidic, Mountain Dew was in 4th place, and Sprite was the least acidic. This experiment conclude that Pepsi is the most acidic soda and Sprite is the least acidic soda.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1161

What are other ways to melt ice other than heat?

Jana Zaarour, Maram Soudani, Joury AlNimer

Private/Iman Academy Southwest

Category:

Chemistry

This experiment investigated which substance—salt, sugar, baking soda, or sand—causes ice to melt the fastest without using heat. Equal amounts of each substance were placed on separate ice samples under the same environmental conditions. The time it took for each ice sample to melt was observed and recorded. The results were compared to determine which substance was most effective at melting ice. It is expected that salt will melt ice the fastest because it lowers the freezing point of water, while sugar and baking soda may have a smaller effect and sand may have little to no effect. This project helps explain how different substances interact with ice and demonstrates important physical science concepts related to freezing point depression and real-world applications such as road safety in winter conditions.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no



Abstract: Science and Engineering Fair of Houston

1162

Which Insulation Material Keeps a Container Warm for the Longest Time?

Juliana Louise Alexandra Dulce

Houston ISD/BCM Biotech Academy at Rusk - MS

Category:

Chemistry

The purpose of this project was to determine which insulation material keeps a container warm for the longest period of time. Common household materials—wool, aluminum foil, newspaper, cotton, and bubble wrap—were tested to compare their ability to reduce heat loss. Identical containers were filled with the same amount of warm water at the same starting temperature and then wrapped with one insulation material. The temperature of the water in each container was measured and recorded at regular time intervals over a set amount of time. The collected data were organized into tables and analyzed using line graphs to compare the temperature changes for each insulation material. The insulation material that showed the smallest decrease in temperature over time was determined to be the most effective. This project demonstrates how different materials affect heat transfer and highlights the importance of insulation in maintaining temperature. The results have real-world applications in energy conservation, such as keeping buildings, food, and beverages warm while reducing energy use.

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check all that apply):

- Human participants potentially hazardous biological agents
 Vertebrate animals microorganisms rDNA tissue

2. This abstract describes only procedures performed by me/us, reflects my/our own independent research, and represents one year's work only.

- yes no

3. I/We worked or used equipment in a regulated research institution or industrial setting.

- yes no

4. This project is a continuation of previous research.

- yes no

5. My display board includes non-published photographs/visual depictions of humans (other than myself):

- yes no

6. I/We hereby certify that the abstract and responses to the above statements are correct and properly reflect my/our own work.

- yes no

