

Abstract: Science and Engineering Fair of Houston

1017

The Rate of Coagulation

Ananya Ghanathay

Conroe ISD /Knox Junior High

Category

Animal Science

Summary The purpose of this experiment is to determine which substance causes milk to coagulate the fastest. The hypothesis states that if lemon juice, vinegar, and citric acid are added to different cups of warm milk, then citric acid will cause the milk to coagulate the fastest because it is the most concentrated. In this experiment, the scientist has added lemon juice, vinegar and citric acid to separate glasses filled with warm milk. Each glass was then timed and monitored to see how much time they took to coagulate. This experiment is observing the time frame each substance takes to coagulate the milk proteins which eventually helps in finding out which one works the fastest. In conclusion, citric acid gave the best results coagulating in about three seconds compared to the about three minutes that the vinegar took and the four minutes and 30 seconds that the lemon juice took. The hypothesis has been supported, and the experiment had the same results as what was predicted to happen. This information will be useful for ongoing research on breast cancer. Some studies have shown that elements of curd such as calcium and vitamin D have properties that are anti-cancer, and this experiment will help people make curd at home in a faster and more reliable way.

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 vertebrate animals microorganisms rDNA tissue

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Abstract: Science and Engineering Fair of Houston

1018

Are they stubby?

Matthew Ito
Hubert Kudlicki
Central Middle School

Category

Animal Science

Our project is about the common/average ratio of different species of tarantula's size of their abdomen and cephalothorax. The reason for our investigation or project is to see what is the most average tarantula and how arboreal and terrestrial tarantulas can be identified or there difference than more than just overall behavior.

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Abstract: Science and Engineering Fair of Houston

1019

Shading Light on Birds Eyesight

Ella Augustine

Conroe ISD /McCullough Junior High

Category

Animal Science

The experiment tested whether UV-coated bird feeders attract more birds than non-coated feeders. Each feeder contained 750ml of bird feeder and was measured once-weekly over a period of four weeks. The data showed differences in the amount of seed consumed from each feeder type, helping us understand if UV coatings make birds more attracted. This study could help improve bird feeder designs to attract more birds.

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Abstract: Science and Engineering Fair of Houston

1020

Heartbeat of a Horse

Hayden Lesak

Clear Creek ISD /Seabrook Intermediate School

Category

Animal Science

Horses have been used forever and their still used to this day. But it's not often to think about their heart rate. This project will show, what activities will make a horses heart rate raise and lower the most. Horses tend to get sweaty the more they work like humans but, dose that affect their heart rate? Grooming a horse is like brushing a person's hair. Relaxing right? So that would that also relax them. In this project the procedure done was first testing the horses resting heart rate and the doing the activity and writing the results on a piece of paper. The data I collected showed my hypothesis was correct, because lunging heart rate was, 84.8bpm and grooming heart rate was, 32.5bpm. For future experimentation, it would be beneficial to include horses with various levels of fitness. The broader sampling would provide insights into how fitness levels affect stress responses and recovery times. Additionally, monitoring the time it takes for each horse to return to its resting heart rate would offer valuable date for understanding recovery.

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Abstract: Science and Engineering Fair of Houston

1021

Does Temperature Affect How Fast A Caterpillar Grows?

Alice He

Conroe ISD /York Junior High

Category

Animal Science

The project "Does Temperature Affect How Fast Caterpillars Grow?" is a collected amount of research conducted by Alice He. She has also conducted an experiment for this project with caterpillars to observe how temperature influences their growth rate. The purpose of the experiment was to determine if varying the temperature of the caterpillars habitat would affect their growth rate. My hypothesis was that as the temperature grew warmer the caterpillars would grow gradually faster than the ones set in the colder temperature environment. In the experiment, Alice settled three caterpillars in each container of food, each starting at 1.2 cm. I took 3 containers and thoroughly cleaned each of them to ensure they would not die due to bacteria. I then spaced out areas so they would not die due to stress from the habitat being too small. I then set each of the containers in different temperatures: low (65°F), medium (72°F) and high (80°F). Each day Alice monitored the caterpillars over a period of about 2 weeks taking pictures of each of the caterpillars and measured their length each day. When the one week period hit, the results from the caterpillars showed how fast their development was. Over the time of 2 weeks the caterpillars cocooned, first being the highest temperature, second the medium temperature, and last being the coldest temperature. In conclusion, Alice's hypothesis was correct and her findings support this answer. Showing that the temperature does have an affect on their growth rate.

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Abstract: Science and Engineering Fair of Houston

1022

Bioluminescent plankton

Clive Edwards

Ethiopia Johnson

SST - Champions College Prep - HS

Category

Animal Science

We wanted to see if bioluminescent plankton help or mess up an ecosystem. We set up a tank with water, plants, and small organisms, added the plankton, and watched what changed. Another tank without plankton was used to compare. We wrote down what happened every day. The plankton either helped by adding oxygen or messed things up by taking resources. In the end, it depended on the conditions. If problems happened, we thought of ways to fix them, like changing the water or adding other species. We just wanted to see what would happen.

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Abstract: Science and Engineering Fair of Houston

1023

Analyzing the Effect of Herbicide on Planarian Regeneration

Ziggy Puig
Central Middle School

Category

Animal Science

Ever since I was little I thought these words were fascinating sorry sorry it would be a fun science fair project to research them. My science like the some of the chemicals in our water and some of the ways it could affect us so we got some words put them in different amounts of the chemical but the same chemicals but higher amounts 1.00% and 0.10 and 0.01 Because they can regenerate body parts so we cut them up put them in the mixtures to see what happened with the effect of them going back so far in the amounts of the two lowest amounts they are the growing the fastest.

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Abstract: Science and Engineering Fair of Houston

1024

Beat The Bugs

Nicole palazzi

Clear Creek ISD /Seabrook Intermediate School

Category

Animal Science

The effects of tone on cricket behavior are an under researched theme; one which could have profound effects on agriculture and chemical use. To address the research gap this study conducted experiments believed to show "If the tone is high then the cricket will be attracted to it." Through live experiments using 15hz,75hz,396hz,440hz,15000hz tones, cricket movement was most influenced by 440hz at a 2.8 Central Tendency MEAN. Of note, it was discovered 75hz had a -3.5 measure of Central Tendency MEAN. No tones had a measurable effect on cricket chirp. Also, no other tones had consistent and significant effect on cricket movement. In conclusion, research showed of the five tones measured the fourth highest tone supported the hypothesis "If the tone is high then the cricket will be attracted to it." However, research tones had no effect on cricket chirps. By broadcasting 440hz tone crickets will be attracted to crops. Crickets are omnivorous and will eat harmful insects and plants. This research data could possibly persuade farmers to stop using harmful chemicals on crops and start using this method.

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Abstract: Science and Engineering Fair of Houston

1025

Snakes on a Plane? How about snakes solving a maze?: Can snakes remember and solve puzzles faster after getting exposed to it many times?

Gabriel Quan

Conroe ISD /McCullough Junior High

Category

Animal Science

Scaly, dangerous, dumb, and “Bite first questions later”, that is what most people think of snakes. When most people talk about snakes, the first words are usually dangerous, venomous, death, or Ew. Pop culture has been ruining snakes’ reputation, portraying them as monsters of havoc or cold hearted reptiles. But that is not true, snakes are animals, just like humans, they can think, remember, feel, and care for their eggs. They are not the dumbfounded creatures people think they are, for zoologists have proven that snakes have good memory, they are able to remember their dens and burrows. Can snakes remember and solve puzzles faster after getting exposed to it many times? Studies on snake learning are rare, and not many people know about it. If people can understand that snakes can solve puzzles such as a maze, it can persuade them that these magnificent creatures are not something to be afraid of. Instead, they can think of snakes as one of them.

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Abstract: Science and Engineering Fair of Houston

1026

Turtle Behavior

Blake Little
Roberson - MS

Category

Animal Science

I will be running a multi sensory investigation on my turtle and will be finding out how different sensories, like different colored lights affect a turtle in different environments. I am doing this, because this is a very informative project that will benefit me, because I have a turtle and I would like to know what they like, and also for others who might be interested in this topic. Different sensories, like different colored lights, will affect turtles and their behavior the same way in different habitats. I also believe that from my research, like humans, when exposed to orange light, the turtle will show signs of excitement, and red light will attract him and he will show signs of anger. To run the experiment, I would first do the aquatic habitat, and then the dry habitat. I would give him a mix of turtle food, 3 pellets, 1 shrimp, and 1 aquatic cranberry. First I would use normal white light, put the food in the tank, and monitor him for 3 minutes. I will monitor how much food he eats, and the amount of activity. Then I will tape the LED's to the tank and use the two colors, orange and red, and use the same procedures to monitor his behavior. I will also do the same exact steps for the dry habitat.

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Abstract: Science and Engineering Fair of Houston

1027

Exploring The Anti-Cancer Properties Of Snake Venom: A Novel Approach To Targeting Tumor Progression

Ammar Ashary

THE HONOR ROLL SCHOOL - MS

Category

Animal Science

The goal of this project was to explore the therapeutic potential of snake venom in cancer research which could uncover the ability to target cancer cells selectively. Thus, suggesting that the unique biochemical properties of various venom types may lead to innovative and more effective treatment strategies for various cancerous malignancies. The project was began with the analysis of various enzymes found in snake venom. This was important as it would help be the cancer cell disabler. I used a type of antibody to bond to the enzyme and make a new protein. In the end I used a software to test the effects of the enzyme on a common protein found within human cells.

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Abstract: Science and Engineering Fair of Houston

1028

Like Man, Like Dog?: Examining Paw Preference in Pet Dogs

Harper Carter

SST - Champions College Prep - MS

Category

Animal Science

Research suggests that, unlike humans, dogs do not share a population-wide preference for their right paws. This could be for a few reasons, including both genetics and the influence culture and society plays in encouraging humans to use their right hands. Domestic dogs do not have the same cultural influences on their paw preference and therefore, as a population, are likely more evenly split between left and right paw dominance. This experiment explored the paw preference of a small population of pet dogs using two different tests, the Kong Test and the “step off” test, to determine whether that hypothesis is true. Using a laterality index to evaluate the results of these tests, the experiment indicated that 1) unlike humans, pet dogs do not exhibit a population-wide preference for the use of their right hand/paw and 2) paw preference in pet dogs may vary depending on the task they are completing. The second finding is important with respect to areas of further study. The results and conclusions from this experiment may be used for further study by veterinarians, canine trainers, and behavioral scientists.

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Abstract: Science and Engineering Fair of Houston

1029

What the chirp?

Emma zamarripa

Clear Creek ISD /Seabrook Intermediate School

Category

Animal Science

Birds have some of the best eyesight. They have four photoreceptors, where humans have three. This allows birds to see a variety of color. White is reflective, so birds perceive this color as a threat. Colors like purple absorb light so in the afternoon they look safer. In the morning, orange, is safer even though it has some reflection. If giving birds an option to choose preferred feeding habits over preferred food, what would they pick? When giving birds the option, they would choose a threatening color but preferred food. The procedure was simple, take three of the same bird feeders; one white with suet, one purple and one orange with mixed seed. Leave the feeders out 7am-5pm then review the footage from the camera. Repeat for fourteen days. Make sure to clean the feeders once a week and keep it away from all human and dog food. The data collected was modest. There were around twenty-five birds throughout the experiment, less than expected. Out of the twenty-five birds, fifteen ate from only orange. The rest preferred the purple, with three birds preferring food over color. The low number of birds could be a result of the squirrels at the feeder. But enough to make an inference that white would not have won at all. Instead, orange would be the preferred feeder for most of the birds. The hypothesis would have been rejected, based on this data.

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Abstract: Science and Engineering Fair of Houston

1030

How do ants find food

Nathan Zhang

Clear Creek ISD /League City Intermediate School

Category

Animal Science

When my dad was doing fire ant control with bait, I found that ants stopped eating the bait after repeated use. By searching online, it was said that ants use their antennae to find food. But I did not find a research article using experiments to test the hypothesis that ants find food using their antennae. After capturing the fire ants, I split them into five groups: ants with intact antennae, ants with partial antennae, ants with only a right antenna, ants with only a left antenna, and ants with no antennae. Then I sedated them to cut the antennae off or to cut part of the antenna off. To keep the variables the same, I sedated the ants that had their intact antennae. After putting them in petri dishes with meat and water, I observed their behavior. I found interesting things, like how they liked to group up, and how the ants with no antennae were always restless. Without their antennae, the ants could not communicate with each other, so the ones with no antennae could not form groups. The antennae of ants are also important for their survival because the ants with no antennae mostly died quickly from thirst because they could not find the water.

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Abstract: Science and Engineering Fair of Houston

1031

Do egg yolks improve hair quality?

Sonya Gopalani

Conroe ISD /Knox Junior High

Category

Animal Science

The purpose of this experiment is to discover if a common product, egg yolks, can truly improve human hair. Testing this can be helpful because it would expand access to effective hair products for those who cannot afford the current expensive options. The hypothesis states that if egg yolks are consistently applied to human hair, then there will be a positive difference in hair strength, porosity, growth, and overall quality because egg yolks include the nutrients that hair needs to improve. In this experiment, the scientist whisked two egg yolks and applied them to the right side of the hair; starting with the scalp through the ends of the hair strands, and leaving the yolk mixture in for twenty minutes then rinsing out. This continued with rinsing and repeating every week for ten weeks. During the experiment, the scientist observed that the side of the hair treated with egg yolk appeared slightly longer than the untreated side. In conclusion, the side of the hair with the application of egg yolk had stronger results than the side without. Even though no significant difference is shown, tests including strength, porosity, and growth measurement prove that egg yolk improves the quality of hair. This experiment supported the hypothesis, though the educated guess aimed for better results than the results shown. This test may assist companies in developing egg-derived hair products that enhance hair quality while remaining cost-effective. If egg yolk in hair goes viral, it could seriously help some individuals out. Therefore, because of this specific experiment, now people can realize eggs are not just for consumption.

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Abstract: Science and Engineering Fair of Houston

3014

Positive Effect of Kefir on the Survival of *Daphnia magna* Infected with Clinical Bacterial Isolates

Anna Singh
Shadow Creek - HS

Category

Animal Science

Kefir, a fermented milk drink, contains probiotics like Lactobacillus and Bifidobacterium, produced through the fermentation of milk by kefir grains. We evaluated commercial kefir brands for protection against bacterial infection in *Daphnia magna*. Kefir optimal concentration was determined and for protection assays $\sim 10^7$ CFU of methicillin-susceptible beta-lactamase type A (MSSA BlaType A) *Staphylococcus aureus*, vancomycin-resistant *Enterococcus faecium*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* were used to infect *Daphnia magna*. Experimental groups contained treatment group as kefir (1%)+*Daphnia magna*+bacteria, control groups kefir (1%)+*Daphnia magna* and bacteria+*Daphnia magna*. Data were recorded over 24 hours. Kefir A significantly improved *Daphnia magna* survival against *S. aureus*, *E. faecium*, and *K. pneumoniae* with P values 0.002, 0.04 and 0.001, respectively. Kefir B and C also provided notable protection against *S. aureus*, *P. aeruginosa*, and *K. pneumoniae*, with P values < 0.01 . Results suggest kefir's potential for gastrointestinal health and underscore *Daphnia magna*'s value as an in vivo model for screening natural compounds against clinically relevant bacterial infections.

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Abstract: Science and Engineering Fair of Houston

3015

A Study of the Effects of Constant Noise Pollution on Palaemonetes paludosus

Wilson Radman

Sebastian Popovici

Conroe ISD /AST: Academy of Science and Technology

Category

Animal Science

Noise pollution is a problematic side effect of urbanization that is becoming increasingly impactful among aquatic life. Though studies have been conducted on vertebrates proving the harmful effects of noise pollution, not many tests have been run on invertebrates, which is why we conducted an experiment on Palaemonetes Paludosus. Our experiment worked by playing three different noise pollution sounds to three different tanks of ghost shrimp individually and recording their heart rates and behaviours before and after the trials. After the experiment, we averaged the resting and post-experiment heart rates in each tank and compared the two average heart rates and behaviour changes in each tank. We ran a t-test on the averages of our results, and our data is statistically significant, meaning that future research on the long-term effects or behavioural effects of noise pollution on aquatic invertebrates is viable, especially if looking into the reason some of our shrimp's hearts swelled up and changed color was caused by an unknown variable or the experiment.

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Abstract: Science and Engineering Fair of Houston

3016

Investigating the Effects of Magnetic Fields in *Drosophila hydei* to Minimize Contamination Rates

Arnav Kulkarni

Conroe ISD /AST: Academy of Science and Technology

Category

Animal Science

Fruit flies are common nuisance pests that are capable of spreading *E. coli*, *Salmonella*, and *Listeria*. This research project focuses on the effects of magnetic fields on fruit flies. This experiment was conducted by the researcher as a cheaper alternative to other more common choices on decreasing fruit fly contamination. The hypothesis was that there will be a significant difference in fruit flies' behavior when exposed to the electromagnet. To test this hypothesis, the researcher used terrariums and a culture of wingless *Drosophila hydei*, a variant of the common fruit fly, to examine the behavior change when exposed to magnets and an electromagnet. Using paper on the bottom of the terrarium and an ANOVA statistical analysis test, the researcher was able to determine that the fruit flies had no change in behavior and the null hypothesis was proven correct. The application of the project was to limit the amount of fruit fly contamination through magnetic fields because of fruit flies' researched ability to sense them. For future projects, the researcher could continue to research more items that could possibly repel *D. hydei* that are more commonly used in repellents or compare the common fruit fly, *Drosophila melanogaster*, with *D. hydei* to see if they react differently to magnetic fields.

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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

3017

Using Operant Conditioning to Train Earthworms to Prefer Decomposing Invasive Plant Species First to Give Native Species a Competitive Advantage

Sonia Modi

Fort Bend ISD /Dulles High School

Category

Animal Science

Earthworms can damage plant roots and consume seeds, hindering germination. This trait could be used to combat invasive plants by training worms to prefer feeding in their areas. The experiment aimed to determine if earthworms could be trained using operant conditioning to feed in areas with invasive species over native ones. The hypothesis was that worms could be conditioned by pairing a negative stimulus (shaking) with a positive stimulus (food). Ten worms were split into experimental and control groups. Each worm was placed in a cardboard box with soil with a leaf from an invasive species (*Hedera helix*) and a native species (*Fittonia albivenis*) buried at opposite ends. Worms were shaken if they moved toward the native plant or did not move within a minute, while those that moved toward the invasive plant received food. This process was repeated for 14 days thrice daily. Only worms 1, 3, and 4 (experimental) and 7 and 10 (control) completed the 14 days. In the second half of the experiment, the experimental group had a 46.0% chance of choosing the invasive plant, a 39.7% chance of not moving, and a 14.2% chance of choosing the native plant. For the control group, this was 23.8%, 47.6%, and 28.6% respectively. The statistically significant difference supports the hypothesis.

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

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Abstract: Science and Engineering Fair of Houston

3018

Year II: Assessing Marine Bivalves as Novel Invertebrate Models for Targeting BCL-2 Family Proteins in Blood Cancer: The *in vivo* Effects of Ursolic Acid and Gossypol Acetic Acid on Tumor Cells in *Mercenaria mercenaria*

Iris Shen

Source: ISD / AST: Academy of Science and Technology

Category

Animal Science

Anti-apoptotic B-cell leukemia/lymphoma (Bcl-2) family proteins are reported to be overexpressed in around half of all human cancers, linked to tumorigenesis, chemotherapy resistance, and poor prognosis. Effectively modeling this complex molecular interaction in leukemia is essential for its progression as a therapeutic target, yet the costliness and time-intensive nature of current leukemic models limit study. Disseminated neoplasia (DN), a transmissible cancer naturally occurring in the hemocyte “blood” cells of bivalve molluscs, shares notable molecular similarities to human leukemia. To determine functional similarities between human and bivalve Bcl-2, *M. mercenaria* was exposed to broad-spectrum Bcl-2 inhibitor AT101 at concentrations of 0.1 mg/kg, 0.3 mg/kg, and 0.6 mg/kg. Lipoprotein abnormalities were identified as accessible biomarkers for DN ($p < 0.05$). Significant cytotoxicity caused to both tumor and normal cells in the treatment group above the dose threshold suggests DN's dose-response concordance with human sensitivity, and changes in cell viability, tumor cell fraction, and lipid accumulation paralleled responses in human studies at 0.3 mg/kg. The combined effects of ursolic acid, a substance predicted with high binding affinity to Bcl-2 proteins, and bioenhancer piperine was also studied as a novel chemotherapeutic combination, yielding significantly slowed tumor growth ($p < 0.03$) and minimal cytotoxicity to normal cells. Results suggest the further exploration of ursolic acid and piperine as a selective therapeutic combination and highlight the capabilities of bivalves as effective *in vivo* cancer models, with potential applications in high-throughput drug screening, minimizing vertebrate testing, and reducing cost per specimen over 50-fold for early phases of novel drug candidate screening.

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- yes no



Abstract: Science and Engineering Fair of Houston

3019

Identifying a tortoise and turtle

Kailon Che

SST - Champions College Prep - HS

Category

Animal Science

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