CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Brittany J. Allison

Project Number
J1001

Project Title
Doggy Vision

Abstract

Objectives/Goals
The point of my research and the overall concept of this project is how dogs see the world, a common question in my mind prior to this project. My specific question for experimentation was: If a dog was concentrating on an object in front of it, which color moving object in its peripheral vision would distract it the fastest? Through experiments with my dog, I hoped to find the answer and make sure it matches the facts of my research.

Methods/Materials
Dog; Green paper; Yellow paper; Black paper; Blue paper; Stopwatch; Bones.
1)Tell dog to sit still.
2)Have a partner hold a bone in front of it; it should watch intently.
3)In the dog#s peripheral vision, wave a color paper.
4)Time how long it takes for the dog to show any sign of looking your way.
5)Record the time in seconds and repeat twice.
6)Repeat steps 1-5 for each remaining color paper.

Results
Color Trial 1 Trial 2 Trial 3 Average
Black 6 10 18 11
Yellow 3 7 11 7
Blue 5 8 10 8
Green 18 20 45 28
*The numbers represent the time (seconds) for the dog to be distracted.

Conclusions/Discussion
After doing my research, conducting my experiment, and analyzing the results, I found that I still had questions that weren#t answered. I understand that there are definite restrictions to my experimentation, and some questions that I may never get answered. Some questions could have been answered by tweaking my experiment to have multiple variables. I could have tested multiple breeds, tested a wider range of colors, tried moving and non-moving objects, etc. Others may just involve more research, such as #Do dogs have the ability to read?# or #Why is a dog#s eyesight different from a human#s?# or #What is the farthest distance that a dog can see?# All these can be answered with further testing and investigation, which is how science builds upon itself.

Summary Statement
My project involves researching and testing dogs' vision, and, most importantly, which colors they can see better than others.

Help Received
I thank Mrs. Rhodes for helping me step by step through the report process, my English teacher Mrs. Goeser for helping me edit my research paper, Mrs. Karo for helping me with my results chart, my mom for being the bone-holder, and my Dad for being the timer.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Asad H. Arastu

Project Number
J1002

Project Title
Get a Head Start II

Abstract

Objectives/Goals
To see if infants receiving the Long Chain Polyunsaturated Fatty Acids (LCPUFAs) such as Docosahexaenoic acid (DHA) and Arachidonic acid (ARA) have an affect on the development of visual, mental, and motor skills. It is hypothesized that the DHA and ARA will make a difference in the development of the infants. The infants that do receive the DHA and ARA will be able to perform more tasks on average that the group that does not.

Methods/Materials
10 infants that received DHA and ARA through mother milk or Enfamil LIPIL acting as the variable group
10 infants that received formula that did not contain DHA and ARA acting as the control group
Procedure- Acquire the twenty infants for testing and monitor their development for eighteen months. Infants were tested in categories of mental, motor, and visual skills to see if DHA and ARA make a difference in brain and eye growth in sixty-three total activities.

Results
Docosahexaenoic acid (DHA) and Arachidonic acid (ARA) help to stimulate eye and brain neurons therefore stimulating development and growth. After the period of eighteen months, the infants that received the DHA and ARA amino acids via breast milk or Enfamil LIPIL showed faster development in visual, mental, and motor skills compared to the control group that did not receive DHA and ARA in the formula milk. A thirty percent difference was noted between the variable and control groups. Nearly seven of ten infants from the variable group were able to complete the various tasks, versus only four of ten from the control group accomplished their tasks.

Conclusions/Discussion
It can be concluded that the infants that received Docosahexaenoic acid (DHA) and Arachidonic acid (ARA) are able to complete more tasks involving motor, visual, and mental skills than those infants who do not receive these vital acids. DHA and ARA make a substantial difference in the visual and mental development of the infant. In addition, these nutrients help the infant to be able to get a head start on life by stimulating their brain and eye neurons.

Summary Statement
To help show the importance of amino acids in early development of infants to get a head start on life.

Help Received
Dr. Vaseema aided in testing portion for safety precautions.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Shiri Bogomolny

Project Number
J1003

Project Title
How Fibonacci Is Your Face?

Abstract

Objectives/Goals
The greater the numbers are in the Fibonacci sequence, the closer their ratios are to the perfect proportion. Based on that fact, the purpose of the project was to find out if such was true with the divine proportions on the face. This investigation was also completed to see if people known as #beautiful# had better proportions than average people. If this was the case, then the divine proportion could be incorporated into plastic and reconstructive surgery in order to improve it.

Methods/Materials
Twenty males and twenty females of each age group were gathered for testing. The age groups were: 5-7 years, 16-18 years, and 40-60 years. Ten pictures of actors and ten pictures of actresses were also tested. Pictures were taken of all the subjects from one meter away, and the following measurements were taken from each picture: the distance from the nose tip to the chin, the distance from the lips to the chin, the length of the lips, and the width of the nose. In order to get the ratios, the distance from the nose tip to the chin was divided by the distance from the lips to the chin, and the length of the lips was divided by the width of the nose.

Results
The Actors had the best proportions out of all. The teenagers had the second closest-to-perfect ratio for the nose tip-chin/lips to chin and the children had the second closest-to-perfect ratio for the lips/ chin proportion.

Conclusions/Discussion
The Fibonacci ratio could improve reconstructive surgery.

Summary Statement
The project was done to test at what age the face was closest to having Fibonacci proportions, and if actors known as "beautiful" really had better proportions than regular people.

Help Received
Mother helped me choose colors for my display and helped me buy all my display materials; dad helped me with ideas

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Amy E. Carr

Project Number
J1004

Project Title
Whose Mouth Is Cleaner?

Abstract

Objectives/Goals
It is said that a dog's mouth is cleaner than a human mouth, so I wanted to see if the theory was true. Even though humans brush their teeth, there are still a lot of food particles and bacteria in our mouths. Dog's mouths are supposed to be self-cleaning. I want to test different dog and different human mouths to see who really has the cleaner mouth. My hypothesis states: Cultures taken from a dog's mouth will grow fewer bacteria than cultures taken from a human's mouth.

Methods/Materials
In order to conduct this experiment, I used a q-tip to swab the cheek lining of three dogs and three humans. I used culture plates to grow the bacteria. Then I rated the amount of growth present and recorded it on a table. I used a bar graph to show the results. I repeated the experiment three times. During the experiment, I had to develop a way to incubate the cultures without having access to a real incubator. I also had to develop a method to count the number of bacterial colonies without using a microscope.

Results
For all three experiments, the human bacteria and the canine bacteria were different from each other. The human bacteria looked like grayish, small spots. The canine bacteria were more yellow or white, and looked more like streaks than spots. The human bacteria grew faster than the canine bacteria, but by day 3 the total bacterial counts were equal.

Conclusions/Discussion
My hypothesis, that cultures taken from a dog's mouth will grow fewer bacteria than cultures taken from a human mouth, was incorrect. The data showed that by day 3 there was an equal amount of bacterial growth for each speciment. However, the bacterium was different for each species, and the canine bacteria grew more slowly at first.
Even though my hypothesis was incorrect, there is some truth to the belief that a dog bite is less likely to be harmful than a human bite. This is because humans have a higher chance of being harmed by their own species specific bacteria.

Summary Statement
To determine whose mouth is cleaner; a dog's or a human's.

Help Received
Community Hospital of the Monterey Peninsula donated materials; Mother helped type report and troubleshoot problems.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Jeremy E. Creighton

Project Number
J1005

Project Title
Does a Mouse Rely More on His Spatial Memory or Vision? A Study on Effects of Reflective Objects on Maze Performance

Abstract

Objectives/Goals
The purpose of this project is to find out if mice rely more on spatial memory or sight; also to learn the affect of reflective objects on mice performance in a maze.

Methods/Materials
I put a mouse in a maze with solid wood walls, then removed the wood walls and replaced certain oncoming walls with mirrors.
Testing Mice For First Run: Mice were conditioned in different mazes for 3 days before actually testing. I tested mice at 2:00 p.m. and 4:00 p.m. At 2:00 p.m. they were tested with wood then reflective objects. Next hour (4:00 p.m.) the order of the type of walls was changed.(Mirrors first, wood next.)Time between testing was to keep them from remembering the maze, and to see if they have a short term memory. The stimuli used was, peanut butter, oatmeal and mouse food. The number of errors and the maze time were recorded. This completed the first test. Test Two -24 hours later:I reversed the order of the mazes and I also changed the setup of the maze walls. There were new turns and different possible errors. They were timed and scored in the same manner. There were three days of testing using a different maze each day. This is a total of 120 tests, over a three day period, two times a day. 10 mice were tested.-(3 weeks old, feeder mice)

Results
Time without reflective objects: Time with reflective objects:
2:00 p.m. / 0.299 min. 2:00 p.m. / 1.33 min.
4:00 p.m. /0 678 min. 4:00 p.m. / 1.11 min.
The reflective objects increased maze time accordingly:
2:00 p.m. : 1.031 minutes 4:00 p.m. : 0.432 minutes.
Average difference in number of errors: 2:00 p.m. / 3 4:00 p.m. / 2

Conclusions/Discussion
Mice do rely more on vision than spatial memory in the maze. Because the mouse had memorized the wood maze, his vision confused his spatial memory when I put him in the reflective maze. My conclusions about the mouse's spatial memory are based on research about rats. Using cognitive maps, the mice either respond to stimuli (vision, smell or taste) which is called a strip map, or he ignores some of the stimuli and uses a comprehensive map. An animal with a strip map in its head follows a narrow path in solving a problem. If he had a comprehensive map he#d view the maze in a more general way and would change his path easily. But when the problem changes somewhat, a narrow strip map proves

Summary Statement
This project proves that mice use vision more than spatial memory to navigate through a maze of reflective objects.

Help Received
Thank you to my sister Audrey for helping me with this project. Thanks to my Mom for typing my report and to my Dad for making the box and pieces for my maze.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Claire G. Dedrick

Project Number
J1006

Project Title
Measuring Human Horsepower

Abstract

Objectives/Goals
My project was to measure the amount of horsepower an average human could generate. I measured the amount they could sustain, and also the greatest they could generate.

Methods/Materials
To do this experiment I timed seven people walking and running up a set of stairs. Then I used their weight, time and the height of the staircase to calculate their horspeower.

Results
I found out that the most horsepower a human generated when running was 0.89 and the least was 0.32. The most a person sustained was 0.36 and the least was 0.17.

Conclusions/Discussion
From my experiment I saw that humans can generate a measurable amount of horsepower. They don't have nearly the power of machines, but the amount can be measued. My results showed that my experiment worked and that my problem could be tested.

Summary Statement
I measured the maximum amount of horsepower that humans could generate and the amount they could sustain.

Help Received
My dad helped design the graph and proofread the report.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Joshua M. Frear

Project Number
J1007

Project Title
Human Battery

Abstract

Objectives/Goals
The experiment will prove which gender produces the most electric current and in which condition do they have a greater current. The testing is done with two different types of metal plates hooked up to an ammeter. The subject then places his/her hands on the plates which gives the ammeter a reading of how strong the electric current is in the subjects body.

Methods/Materials
Materials:
[1] Copper Plate [1] Aluminum Plate [1] Large block of wood [1] Micro Ammeter[x] Human test subjects [1] Sink with running water

Procedure:
1. Gather all materials 2. Set up experiment 2a. Place metal plates over wooden blocks (to keep other electric currents from reaching the plates) 2b. Set negative side of ammeter to one plate 2c. Set positive side of ammeter to other plate 2d. Turn the ammeter to 2mA 3. Have subject place each hand on a separate plate 4. Record the reading from the ammeter 5. Repeat [Steps 3&4] with different subjects 6. Have subjects thoroughly wash their hands with water and dry them 7. Repeat [Steps 3,4,&5] with different subjects 8. Have subjects jump in one spot for approximately 1 minute 9. Have the subjects rub their hands together 10. Repeat [Steps 3,4,&5] with different subjects 11. Chart the results from the data 12. Find average of both genders 13. Find average of all the different #conditions#

Results
The results of the testing showed that the Males produced a stronger current of electricity. The males average was .056 amps and .047 amps for the females. The jumping did increase the strength of the current but some males had different results and had a better current from not doing anything. These results may have had an error from the test subject. Some of the males either didn#t participate correctly, or they didn#t sweat enough for the correct reading from the ammeter.

Conclusions/Discussion
The experiment is important because it can be used in certain medical monitoring or artificial parts. Pacemakers can vary from person to person on how strong they need to be. We can determine the strength of a pacemaker by the gender and type conditions the person undergoes the most. Since females generate the most electricity in their bodies, they need a stronger pacemaker as opposed to males. A normal, clean, active person would need a stronger pacemaker as well.

Summary Statement
The experiment will prove which gender produces the most electric current and in which condition do they have a greater current.

Help Received
Grandfather purchased materials and helped set up board. Neighbor helped with ammeter settings.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Kristina E. Fung

Project Number
J1008

Project Title
Are Fingerprints Hereditary? A Statistical Analysis

Abstract

Objectives/Goals
The purpose of my science fair project is to determine whether fingerprints are hereditary, which types are hereditary, and which parent to child combination is most hereditary.

Methods/Materials
Collecting data: look at fingerprints or ink the fingerprints. Label using ten types: left loops(LL), left pocket loops (LPL), right loops (RL), right pocket loops(RPL), central pocket loops(CPL), double loops(DL), arches(A), tentarches(TA), whorls(W), and accidentals(X). A family must have a father (F), mother (M), and at least 1 child (daughter-D or son-S).
For analyzing data, a scientific calculator and a z-test distribution table are necessary. For generating random families, generate random numbers with the calculator to assign each individual to a new family. Maintain family composition (if a family has two daughters, the new random family in its place should have two daughters). To create a proportion #r# (null hypothesis), take e.g. the # of sons# prints that are LL and divide it by the total # of sons# prints. Create a second proportion #p## the sample statistic # the #of sons# prints that are LL where the father#s print was also an LL divided by the # of sons# prints that are LL. Next, calculate the standard deviation (SD) of the second proportion. Use SD= the square root of [p(1 - p) /n], where n is the # of sons. To calculate the Z-statistic, use [Z =(p #r)/SD]. Next, calculate the same for the # of sons# prints that are LL where the M#s print was also an LL divided by the # of Ss# prints that are LL. Do the same for all 10 types of prints. Repeat for S-M, D-F, and D-M. With the Z-test, use a confidence level of 95%.

Results
In all, there were 15.2 average matches from all the real categories, and 10 average matches from all the random categories.
LL, As, and TAs were shown to be hereditary in all four parent to child comparisons. LPL and PL were shown to be hereditary in three of the parent to child comparison groups. RPL, CPL, and Ws were shown to be hereditary in two of the comparison groups. DLs could only be shown hereditary in one group. Accidentals were not shown to be hereditary in any of the groups.

Conclusions/Discussion
My hypothesis was correct in that fingerprints are hereditary and that in my sample, the Ss to Fs were the most hereditary, but I was incorrect because I couldn#t show that all the types I evaluated were hereditary and Ds to Ms was not the most hereditary group.

Summary Statement
I determined whether fingerprints are hereditary, which types are hereditary, and which parent to child combination is most hereditary using a z-test and other statistical methods.

Help Received
Over 30 families contributed fingerprints; science teacher helped me find volunteers, lent materials, helped with stats, edited writing; math teacher helped with stats, lent materials; friend and friend#s father edited writing; family helped me find volunteers, helped with math/stats/data, bibliography, and edited

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Erika M. Gleim

Project Number
J1009

Project Title
Determining The Effects of Various Animal Hair and Temperature Variations on Mice Behavior

Abstract

Objectives/Goals
To determine if mice have a positive or negative reaction to the certain animal hairs in diferent temperatures.

Methods/Materials
First you heat up one of the six hairs(cat,dog,human,horse,rabbit,and wool)to90*F.Then you put it in the right side of the container and then you put the mouse in the middle of the container. you test for 10 minutes and you do that 10 timer to each hair. do the same thing except for heating the hair.

Results
The mouse had a positive reaction to the wool in the 90*F temperature. Then in room tempreature the mouse had a positive reaction to the human and rabbit hair.

Conclusions/Discussion
In the 90* temperature the mouse had a positive reaction to the hairs a lot more than the room temperature results.

Summary Statement
To determine if mice have a positive or negative reaction to certain hairs in different temperatures.

Help Received
mom helped with board

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Jessie M. Hagiwara

Project Number
J1010

Project Title
Blowing Off Carbon Dioxide

Abstract

Objectives/Goals
The objective of my project is to see what type of exercises makes people produce the most carbon dioxide.

Methods/Materials
Materials:test subjects, liquid measuring cup that reads in mL, several glasses to hold water, several straws of equal lenth and diameter, microwave timer, tap water, pH testing paper-hydron lab quality,narrow interval
Methods: 1.Measure 240 mL. of tap water and pour into glass-repeat 4 times so you end up with 5 glasses of tap water -having the water ready before makes things easer. 2.Dip a piece of the pH paper in the water and compare to to the color scale-recored pH. 3.Have the subject blow into the first glass of water through the straw for 30 seconds. 4.Test the pH of the water immediately. Record this as: "pH before exercise." Dump water , set glass aside and replace with fresh glass. 5. Have test subjects run in place for 5 minutes , then quickly reapeat steps 3 and 4. 6. Have test subject rest for 2 minutes, then have him/her do 25 sit ups. Quickly repeat steps 3 and 4. 7. Have test subject rest for 2 minutes and then do 10 push ups. Quickly repeat steps 3 and 4. 8.Have test subject rest for 2 minutes and then do 20 military presses. 9. Repeat steps 3 and 4. 10.Repeat experiment with each subject.

Results
The Milatary press wich uses both leg and arm muscles, and is faced paced. It really increases heart rate and works the muscles.

Conclusions/Discussion
Exercises that work more than one muscle group and is aerobic will make you give off the most carbon dioxide which means burning more calories. The milatary press produced the most carbon dioxide. That means this type of exercise will help people lose weight or keep their weight under control. It can also help keep your heart healthy.

Summary Statement
I wanted to find out which type of exercise makes the most carbon dioxide, and requires the most energy.

Help Received
My mom helped me with some of the typing, the paper cutter, and the Excel program.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
William J. Juri

Project Number
J1011

Project Title
Can You Make the Grade? Fitness: Body Mass vs. Heart Rate

Abstract

Objectives/Goals
There are many news programs and newspaper articles about overweight children. This project measures a twelve year old boy's Body Mass Index to determine if it relates to his physical fitness level as determined by the Harvard Step Test. My prediction is that a twelve year old boy's Body Mass Index rating will not correlate to their Recovery Index "grade" because there is more than height and weight to consider when determining health.

Methods/Materials
First, consent forms were obtained from twenty twelve year old boys. Each subject's height and weight were measured to determine their Body Mass Index. Each test subject stepped up and down from a bench at thirty times per minute for four minutes. The bench height was determined by each subject's height. One minute after the test, the test subject's heart beats were counted for 30 seconds. Their heart beats were counted three times waiting thirty seconds in between each reading. Recovery Index and Body Mass Index were calculated. Graphs and tables were made to analyze data.

Results
Body Mass Index doesn't have a direct correlation to physical fitness according to the Harvard Step Test for a twelve year old boy. Test subjects within the normal Body Mass Index range had physical fitness levels that were excellent, good, and fair. Test subjects who were "at risk" and "overweight" had physical fitness levels that were excellent and good. An example of why Body Mass Index and Recovery Index didn't correlate was that two test subjects in the "normal" category had a Body Mass Index difference of only .08. However, they had a recovery index difference of 74.83 with one subject in the fair region and below the other nineteen test subjects, and the other in the excellent region and above all of the other nineteen test subjects.

Conclusions/Discussion
After analyzing the data, I concluded that my hypothesis was correct. Body Mass Index doesn't have a direct correlation to physical fitness according to the Harvard Step Test for a twelve year old boy. It's important for health professionals to not only look at someone's Body Mass Index to determine their state of health, but to look at their physical fitness level as well. One way to check someone's physical fitness level is to use the Harvard Step Test. Thus, Body Mass Index is not the only test that should be used to check someone's state of health.

Summary Statement
This project determines if a twelve year old boy's Body Mass Index relates to his physical fitness level as determined by the Harvard Step Test.

Help Received
Mother helped supervise for safety precautions; Father helped find a board to step from; Twenty twelve year old boys helped by participating in my test as test subjects.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

Kevin P. Kennedy

Project Number

J1012

Project Title

Surprising Effects of Body Position and Temperature on Blood Pressure and Heart Rate

Abstract

Objectives/Goals

I INVESTIGATED THREE MAIN HYPOTHESES IN MY EXPERIMENT: HYPOTHESIS (1): A 90 DEG FULL BODY INVERSION WITH HEAD DOWN TILT WILL GIVE A SIMILAR DIASTOLIC (DBP) AND HEART RATE (HR) RESPONSE AS A FULL BODY 90 DEG HEAD UP INVERSION (STANDING).

HYPOTHESIS (2): A MILDER FULL BODY 45 DEG HEAD DOWN TILT WILL GIVE A SIMILAR DBP AND HR RESPONSE AS A FULL BODY 45 DEG HEAD UP TILT.

HYPOTHESIS (3): FULL BODY HEATING TO JACUZZI TEMPERATURE (105 DEG F) WILL DECREASE DBP DUE TO BLOOD VESSEL DILATION, AND INCREASE HR TO COMPENSATE FOR THIS REDUCTION IN DBP. MY THIRD HYPOTHESIS ALSO STATES THAT BEING PLACED IN A BATH AT A NEUTRAL TEMPERATURE (85 DEG F) WILL NOT ALTER SBP, DBP OR HR.

Methods/Materials

I USED AN AUTOMATED BP AND HR MEASURING DEVICE TO MEASURE BP AND HR. SUBJECT NUMBERS RANGED FROM 4-7 PER EXPERIMENT WITH AN AGE RANGE OF 13-52 YEARS. EXPERIMENTS WERE ALWAYS CONDUCTED IN QUIET AREAS. FROM 5 TO 10 CONSECUTIVE BP AND HR MEASUREMENTS WERE TAKEN AT 1 MIN INTERVALS PER CONDITION FOR EACH SUBJECT IN EACH EXPERIMENT. DATA WERE ANALYZED BY REPEATED MEASURES ANOVA AND PAIRED T-TEST.

Results

MY RESULTS SUPPORT THE IDEA THAT HR INCREASES MORE IN RESPONSE TO 90 DEG HEAD UP TILT (STANDING) THAN 90 DEG HEAD DOWN TILT. SIMILARLY THERE IS A GREATER RESPONSE TO 45 DEG HEAD UP TILT THAN 45 DEG HEAD DOWN TILT. I ALSO FOUND THAT FULL BODY HEATING AT HOT BATH TEMPERATURE (105 DEG F) LOWERS DBP AND INCREASES HR WHILE IN A ROOM TEMPERATURE BATH (85 DEG F) SBP, DBP, AND HR REMAIN UNCHANGED.

Conclusions/Discussion

I FOUND THAT THE GREATER INCREASE IN HR WITH HEAD UP TILT THAN HEAD DOWN TILT MAY BE DUE TO THE FACT THAT THERE IS A GREATER REDUCTION IN CARDIAC OUTPUT IN THE HEAD UP POSITION THAN IN THE HEAD DOWN POSITION. ANOTHER CAUSE MAY BE A GREATER EVOLUTIONARY INFLUENCE FOR NORMALIZATION OF BP

Summary Statement

MY PROJECT INVESTIGATED SOME OF THE MECHANISMS, SPECIFICALLY BODY POSITION AND TEMPERATURE, THAT AFFECT BLOOD PRESSURE AND HEART RATE.

Help Received

AQUIRED ANALYZING AND GRAPHING SOFTWARE FROM DAD

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Joe Kummerfeld; Brian Spain

Project Number
J1013

Project Title
In the Blink of an Eye: The Effects of Reading and Working on the Computer on Vision

Abstract

Objectives/Goals
The objective is to determine if a person blinks less, and therefore vision worsens after reading and working on the computer.

Methods/Materials
Informed consent was obtained from 15 subjects, men and women ranging in age from 10 to 103. Baseline data was obtained which included average number of times each subject blinked and their baseline near vision. A control test was done to see if a person's vision decreased while staring without blinking for thirty seconds. The experimental procedure included counting the number of times a person blinked while reading and working on the computer for two time frames, two minutes and ten minutes, and testing vision immediately after with a Rosenbaum Pocket Vision Screener.

Results
Ten of the fifteen subjects had diminished vision in at least one eye after working for just two minutes on the computer and thirteen of the fifteen had diminished vision after ten minutes of working on the computer. After reading twelve of the fifteen had diminished vision in at least one eye after both two and ten minute intervals. All subjects blinked fewer times per minute while working on the computer for two and ten minute intervals and reading for ten minutes. All but one blinked less while reading for two minutes.

Conclusions/Discussion
The results of the experiment showed conclusively that vision decreased after reading and working on the computer, especially in those subjects that did not blink very often. In the longer time frame there was an even greater decrease in vision. Only those younger subjects who had 20/20 baseline vision did not have a decrease in their vision after reading or working on the computer.

Summary Statement
Our project was designed to prove that computer work and reading may lead to infrequent blinking and decreased vision.

Help Received
Our project was supervised by our science teacher and by our parents.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Elan D. Lee

Project Number
J1014

Project Title
Do Rats Learn Faster with Peer Pressure?

Abstract

Objectives/Goals
The question asked was will a rat trained in a dual chamber skinner box learn faster if it is next to a rat that has already been trained? My hypothesis was that a rat trained with a demonstrator rat will learn to press the lever faster than if it learned alone.

Methods/Materials
To test this hypothesis a dual chamber Skinner box was built providing identical chambers to two rats that were separated with Plexiglas so they can observe each other but are not together. The time a rat learned to press the lever for food was determined for one solo rat. This time was compared with five observer rats that were trained with the demonstrator rat that was already trained. The number of 5-minute training sessions to achieve final learning of task was recorded. Behavior was categorized as NB - rat is reward by approximating lever; SB - rat is rewarded for inadvertently touching lever; B - rat is rewarded for pushing lever but is unsure of cause of reward; and WB - rat is obviously pushing lever in anticipation of reward. Final learning was considered WB 4 times in a row.

Results
The time to achieve learning the task of pressing the Skinner box for the solo demonstrator rat was 33 sessions. The average training time for the 5 observer rats was 24.7 sessions.

Conclusions/Discussion
Rats learned faster with peer pressure. Rats exhibit social behavior and are capable of imitation in order to obtain a desired goal. Future experiments can be repeated with different demonstrator rats to insure that the demonstrator rat is not simply smarter than the observer rats. Other types of controls in this experiment could include observer rats being trained by a demonstrator that is getting free food or no food. Many more rats and repetition of the experiment would be required to prove a stronger conclusion.

Summary Statement
Using a dual chamber Skinner box, it was determined that rats learn faster to press a lever on a skinner box when placed near a demonstrator rat that was already trained.

Help Received
My father assisted me solder the wires together on this Skinner Box.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Geoffrey D. Lee

Project Number
J1015

Project Title
Ultraviolet Radiation

Abstract

Objectives/Goals
The objective to this project is to find whether or not an ultra violet light will effect the strength of hair strands.

Methods/Materials
The materials required for this expiriment are: 1 black light, 10 strands of hair (to be used as control), 10 strands of hair (to be ised for exposure), 1 spring scale, 1 box wrapped in tin foil.
Place the black light in the box wrapped in tin foil. Turn the light on. Set 10 strands of hair in the box and cover for 48 hours. Let hair sit for an additional 24 hours after the light is turned off. Place one strand of control hair around spring scale and pull until breaks. Record grams in which it broke at. Repeat for all hair, control and exposed.

Results
I found out that an ultra violet light does effect the strength of hair.
Average strength of control hair: 170 grams
Average strength of exposed hair: 75 grams

Conclusions/Discussion
My conclusion is that an ultra violet light will effect the strength of hair and not to stay in the sun for long periods of time.

Summary Statement
My project is to determine whether ultra violet light/radiation has an effect on hair strength.

Help Received
I recieved help from my mom.She bought the materials for me and donated the hair.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Alexander M. Lopez

Project Number
J1016

Project Title
What Angle of Impact Has the Most Effect on Making a Bruise?

Abstract

Objectives/Goals
My project was to determine what angle of impact has the most effect on making a bruise. I believe a direct hit has the greatest impact to the skin test models.

Methods/Materials
I made three skin test samples that are identical in size and shape. The material use to make and construct the skin test sample describes the function of the anatomy of the skin.I created an apparatus called a bruise maker to create the bruise and control the impact of the skin test models. I followed my test procedure for all angle cases to ensure repeatability. I tested 3 skin test models at 0 (direct impact), 10, 20, 30 and 40 degrees.

Results
The results showed that the impact from the weight on the front side of the papillary dermis (cotton round) where similar in size for all angles. I measured the blue stain from the papillary dermis and could see where the impact occurred on each test samples. On the backside of the papillary dermis, the blue stain was much larger for 0 degree than any other angle on each test sample. After 5 minutes, the data showed that the blue stain were larger at 0 degrees than any other angle.

Conclusions/Discussion
A direct hit at 0 degrees rupture more capillaries and damages more tissues than any other degrees as shown in my test models. An interesting observation was for all cases, that the front impact of the tissue was small in size but double in size underneath the skin.

Summary Statement
My project was to determine what angle of impact has the most effect on making a bruise.

Help Received
Dad helped me out on reinforcing the bruise maker and getting his opinion.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Lucas C. Miller

Project Number
J1017

Project Title
Retinal Glare Recovery

Abstract

Objectives/Goals
My project was to determine what factors affected the retinal glare recovery test. This test glares the retina with a bright light and measures the retina's ability to recover vision again in time. I had originally hypothesized that eye color, skin color, and age would affect the rate of retinal glare recovery.

Methods/Materials
I used a special visual acuity card with difficult low contrast letters (the SKILL card), pupil size measurer, a luminance box, and a watch to test the retinal recovery time from glare.

Results
Pupil size had no correlations. Eye color showed that the lighter the eye color, the better the recovery time, which was against my hypotheses. During testing, I noticed that some family members had results near each other, so I added that as one of my variables.

Conclusions/Discussion
My observation that some children had results that were the same as one parent but not the other had never before been noted by scientsts or doctors. This test has been used for diagnosing retinal diseases or the toxic effects from certain drugs. My observation of clusters within families is unusual because doctors had only examined individual patients. Examining families was simply my way of getting more subjects. That is why my observations were unique. My testing of families may lead to a less expensive test for retinal genetic links than bio-chemical tests for predicting retinal problems later in life.

I conclude that my appreciation of the family clusters was more important than my original hypothesis where results were mixed.

I have learned that this type of observation is the way many important discoveries are made in science.

Summary Statement
My project was to determine what factors affect retinal glare recovery.

Help Received
Dr. Jampolsky (Grandpa) helped edit papers.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Sarah J. O'Keefe

Project Number
J1018

Project Title
Does Blood Pressure Affect Heart Rate?

Abstract

Objectives/Goals
The objective of my project was to see if there will be a relationship between blood pressure and heart rate.

Methods/Materials
I measured blood pressure and heart rate in eight subjects (two adult male, two adult female, two teen female, and two male children) sitting, laying down, raised to a 45 degree angle, 90 degree angle and laying down. There was a five minute period between each change in position. I used a tilt table, blood pressure cuff and stethoscope and watch to take my readings.

Results
I was able to change systolic pressure in 6 of 8 subjects and change diastolic pressure in all 8 subjects based on their position on my tilt table. The pulse rates of all subjects changed in each position of the tilt table. The greatest change in the blood pressure and heart rate occurred for 6 of 8 subjects when they were moved from 90 degrees to lying down.

Conclusions/Discussion
Six of my eight subjects had similar results. I was able to trigger a drop in blood pressure at the end of the subject's time on the tilt table. When a subject was moved from the 90-degree position to lying down there was a drop in blood pressure and an increase in heart rate. I was able to prove my hypothesis that blood pressure and heart rate are related. When there is a drop in blood pressure the heart increases blood flow by beating faster to compensate.

Summary Statement
For my project I wanted to see if there was a relationship between blood pressure and heart rate.

Help Received
Father helped me build the tilt table. Mother helped with the display board. Neighbor taught me how to take blood pressure and pulse readings. Neighbors and family were subjects.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Ruth K. Park

Project Number
J1019

Project Title
To Chew or Not to Chew

Abstract

Objectives/Goals
To determine if different types of gum has an effect on the temperature of a person's mouth. I believe that chewing different types of gum will increase the temperature of a person's mouth regardless of flavor.

Methods/Materials
Fifteen volunteers kept their mouths still for five minutes. The temperature before chewing was taken with 15 oral thermometers. The volunteers were split into 3 groups. Group 1 was given 2 pieces of cinnamon-flavored gum. Group 2 was given 2 pieces of mint-flavored gum and group 3 was given no gum. Volunteers chewed for 2 minutes with the beat of a metronome set at a frequency of 144. The temperature was taken after 2 minutes of chewing.

Results
Mint group, cinnamon group and no gum group all had an increase in temperature. Cinnamon group had the highest change in temperature compare to the other two groups.

Conclusions/Discussion
I found out from my background research that chewing gum causes the temperature of a person's mouth to rise due to increase in blood flow to the tongue, jaw, and cheek muscles. I also found out that it is just the sensation of being hot or cool and not the temperature of the mouth. I hypothesized that chewing mint gum, cinnamon gum, and no gum will raise the temperature of the mouth regardless of flavor.
I conducted the experiment (see methods/material) and got the result (see result). My hypothesis was partially supported because all three groups had some rise in temperature. I did not expect the cinnamon gum group to have most change in temperature. Therefore, I am uncertain as to whether or not the temperature change was due to flavor. Maybe some of the errors I made in the experiment caused the cinnamon group's temperature change to be higher than all the other groups.
I learned that no matter what kind of gum you are chewing, the temperature in your mouth still changes and increases. However, due to some of the errors, I do not know for sure if the cinnamon flavor has an affect on a person's mouth. Cinnamon group had the highest change in temperature. I would have to do another experiment without errors to find a definite answer.

Summary Statement
Chewing gum raises the temperature of a person's mouth regardless of gum flavor.

Help Received
Science teacher answered questions; My teacher proofread; Dr. Griffin gave educated guess; My sister helped with graph, typing, and setting up; 15 Volunteers participated in my experiment.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Merridee Parker

Project Number
J1020

Project Title
Family Fingerprints

Abstract

Objectives/Goals
The purpose of my project is to see if heredity affects an individual's fingerprints.

Methods/Materials
I used 3 families, 30 blank white index cards, and an ink pad. I filled out cards for each person and took their fingerprints. I identified the print patterns and compared the parents' fingerprints with those of their children.

Results
In the first family, one child had 5 print patterns in common with at least one parent, and the second child had 4. In the second family, one child had 4 in common, and the second child had 2. For the third family, both children had 4 print patterns in common with the parents.

Conclusions/Discussion
On average the children had 4 out of 5 print patterns in common with their parents. Heredity does have an effect on the patterns in fingerprints. Sure, there are differences, but some of the basic patterns are the same. With genetics, traits are passed on to children, traits including basic fingerprint patterns.

Summary Statement
My project shows that fingerprint patterns are affected by heredity / genetics.

Help Received
I received help from three families who let me take their fingerprints.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Wendy V. Puquirre

Project Number
J1021

Project Title
The Effect of Ingested Fluid Temperature on Basal Body Temperature in Humans

Abstract

Objectives/Goals
I wanted to know if the temperature of ingested fluids affects orally measured body temperature in humans. I believed it would affect basal body temperature because when people feel hot or cold, they often drink fluids of the opposite temperature.

Methods/Materials
First I took the temperatures of 32 people, in degrees Fahrenheit, using a digital thermometer and a new cover slip. Then I asked them to drink one of three liquids, which were all at different temperatures. Ten minutes after they were done, I used a new cover slip and retook their temperatures. Each of my volunteers had to drink all three liquids, but only one liquid per day. When I was done collecting all of my data, I created a scatter plot for each liquid, and compared the before and after temperatures with a Y- X line.

Results
Most of the people who drank the hot liquid, 64%, had a temperature increase. Most of the people who drank cold liquid, 81%, had a temperature decrease. Most of the control group, 94%, experienced some temperature change.

Conclusions/Discussion
The reason some of my data shows that some body temperatures responded differently than I expected may be because I made an error in measuring their temperatures. For example, I did not expect that a body temperature would rise if a person drank cold liquid. Also, many of my participants were moving during the ten minutes between their two temperature measurements, which probably caused their temperatures to change. I think testing more people would allow me to draw better conclusions from my data, and using an ear thermometer may work as a more accurate measurement of temperature.

Summary Statement
The purpose of my project was to find out if the temperature of ingested fluids affects orally measured body temperature in humans.

Help Received
Mr. Simonsen, my science teacher, helped me by teaching me how to display my results and edit my project. My mom also helped me decorate my display board.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Daniela T. Riedelsheimer

Project Number
J1022

Project Title
Aromatherapy: The Effects of Various Aromas on Animal Behavior

Abstract

Objectives/Goals
The purpose of my science project is to observe if aromatherapy affects a hamsters behavior. My hypothesis stated that the hamster's sctivity level and appetite would increase by the aroma from the different oils. I am using three hamsters in three separate cages. When the hamster's are exposed to different aromas, will it change their activity level and appetite. I observed each hamster's daily routine for two days and recorded their activity level(run on the wheel) as well as how much they ate.

Methods/Materials
I'm using the following aromatic oils: Lavender, Orange Ginger, Sweet Fennel, Cardamom. I put one drop of oil on a cotton ball and taped it on the bottom of a film container. I poked holes in the lid of the film container and placed the containers in each cage. The hamster's will not come in contact with the oil except to smell the aroma. I recorded each hamster's time in seconds on the activity wheel between the hours 4:00PM to 12:00AM. I repeated this procedure with each oil. The second part of my test I recorded the amount of food the hamster's ate in a 24 hour period.

Results
Activity Level in seconds:
Control (no aromatherapy)average time on wheel 19.8 seconds
Lavevder oil (relax, sleep) average time on wheel 1.1 seconds
Orange Ginger (energizing) average time on wheel 91.4 seconds
Cardamom (appetite stimulant) average time on wheel 32.4 seconds
Sweet Fennel (appetite suppressant) average time on wheel 9.8 seconds

Percentage of food consumed in a 24 hour period: Lavender 55%, Orange Ginger 53%, Cardamom 70%, Sweet Fennel 67%.

Conclusions/Discussion
When Lavender was added the hamster's did not go on the wheel (1.1 seconds.) When Orange Ginger was added the hamster's were very active an average time of 91.4 seconds. The percetage of food eaten compared to the control at 63% the hamsters ate less food when Orange Ginger aroma was in the cage at 53% and when Cardamom aroma was in the cage their appetite increased at 70%. Depending on the aroma the activity level and appetite did increase or decrease.

Summary Statement
The purpose of my science project is to observe if various aromas, Lavender, Orange Ginger, Swweet Fennel and Cardamom affect a hamster's activity level and appetite.

Help Received
My mom helped with proof reading this project and the district science teacher helped with graphs.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)

Aaron Roth; Nathan Roth

Project Number

J1023

Project Title

Blood in Action: The Effect of Exercise on Blood Pressure and Pulse Rate

Abstract

Objectives/Goals

The goal of this experiment is to determine the immediate and short-term effect of different levels of exercise on blood pressure and pulse rate. It was hypothesized that blood pressure and pulse rate would rise due to exercise, and more rigorous exercise would raise both blood pressure and pulse rate higher than mild exercise. It was further hypothesized that pulse and blood pressure would take longer to return to their resting measurements after the high-intensity exercise.

Methods/Materials

Participants of the same gender and age were asked to complete ten minutes of mild exercise by walking, and ten minutes of more vigorous exercise by jumping rope. Using a digital blood pressure/pulse cuff, measurements of pulse rate and blood pressure were taken before the exercise, immediately after the exercise, and at regular intervals up to thirty minutes after the exercise. The data was recorded and analyzed.

Results

Exercise elevated both blood pressure and pulse rate, increasing more after jumping rope than after walking. Immediately after jumping rope, the pulse rate was about twice as high as the immediate pulse rate after walking. Blood pressure after jumping rope increased about 46% and 61% for systolic and diastolic, respectively, over walking. Additionally, it took longer for pulse rate and blood pressure to return to their resting measurements after jumping rope than after walking. The pulse and blood pressure after walking had returned to normal after a thirty-minute rest, but after jumping rope neither had returned to normal after a thirty-minute rest.

Conclusions/Discussion

Based on the data collected and the results of this study, all three parts of the hypothesis should be accepted. A larger sample size and control over factors such as size, fitness level, diet, and accuracy of measurements would increase the reliability of this experiment. To find out more about the relationship between exercise and blood pressure and pulse rate, similar experiments could be designed. Comparisons after completing the same activity for a prolonged period of time versus a short period of time could be made. It would also be interesting to see if the results of this experiment would stay the same if comparing age groups, genders, or fitness levels. This information could be helpful in creating safe exercise plans and healthy lifestyles.

Summary Statement

Exercise increases blood pressure and pulse rate with more rigorous exercise having a larger effect both immediately and 30 minutes after the exercise.

Help Received

Mother took pictures and helped with measurements in laying out the display board

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Natalie M. Sardonia

Project Number
J1024

Project Title
How Is the Amount of Light Transmitted into the Eye Affected by Increasing Amounts of Cataracts?

Abstract

Objectives/Goals
To show that as the amount of cataract formation increases the amount of light transmitted into the eye decreased

Methods/Materials
Go into a dardened room. Take a model of the human eye and measure and record axial and lenticular length. Layout and mark the positions of the light source.the lens and light meter. Place the light a fixed distance from the lens and meter. Vary the amount of cataract by darkening contact lenses with bio glo and food coloring. Use light meter to measure light transmitted through different levels of cataracts. Be sure the distances remain the same and carefully record the results.

Results
As expected when the amount of cataract formation increased the amount of light transmitted into the eye decreased.

Conclusions/Discussion
Variables such as internal reflection and light scattering have a negative affect on transmission into the eye but my experiement showed that as you increase cataract formation there is a dramatic decrease in light transmission.

Summary Statement
The amount of light transmission into an eye is directly affected by the degree of cataract formation.

Help Received
Dad helped with the models and checked the legnths before the data was collected.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Jessica A. Souza

Project Number
J1025

Project Title
Now You See It, Now You Don't!

Abstract

Objectives/Goals
The object of my project was to determine if age affects the size of a person's blind spot.

Methods/Materials
The way I determined the blind spot size was I held a ruler on the subject's nose, which had an index card with a cross on the right and a dot on the left, at the end of the ruler. 120 females,60 teenagers, and 60 middle-aged women covered their right eye and observed the card moving down the ruler until the dot disappeared. The distance the card was from the subject's face was written down. The examiner continued to move the card down the ruler until the dot reappeared, this distance was also recorded. The difference between the two numbers determines their blind spot size. Each person was tested 3 times. The materials I used were: A ruler, an index card, a writing utensil, and a log book.

Results
The results of my project were that age does affect the size of a person's blind spot. The average blind spot size for teenage girls was 2.5 inches while it was 2.9 inches for middle-aged women.

Conclusions/Discussion
The hypothesis was, "Does age affect the size of a person's blind spot?" The results showed that age does affect the size of a person's blind spot. Therefore my hypothesis was supported.

Summary Statement
To determine if age affects the size of a person's blind spot size.

Help Received
No help was recieved in completing this project.

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Logan F. Stokols

Project Number
J1026

Project Title
The Effect of Pupil Dilation on Peripheral Vision

Abstract

Objectives/Goals
I tested to see whether pupil dilation would increase or decrease peripheral vision. I felt that when the pupil constricts due to light exposure, some of the photoreceptors in the retina would be blocked from light. I thought that peripheral vision would therefore decrease as more lights were turned on.

Methods/Materials
I built a light controlled apparatus with 4 red lightbulbs. The subject placed his head inside with 1 red light on. I measured peripheral vision, then repeated with 2 red lights on, etc. I used red lights because the rod photoreceptors cannot see red. In this way the photoreceptors were not variable but the iris was. The subjects were looking at an X in the back of the apparatus so that their heads would not move.

Results
There was little or no change, on average, from test to test. On the few subjects that did change in peripheral vision at different light levels, the change did not seem to correlate in any way to the light.

Conclusions/Discussion
Pupil size does not seem to affect peripheral vision. I now believe that the lens somehow bends light, either so that we can see around the iris or so that we never see that far out and only see through the center of our pupil. Another possibility is that the change is so slight that my experiment could not measure it.

Summary Statement
I tested to see if dilation of the pupil affects peripheral vision by testing vision at different levels of light.

Help Received
Father helped to build the apparatus

CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
Heather L. Williams

Project Number
J1027

Project Title
Are You Cross-Dominant, or Not?

Abstract

Objectives/Goals
The objective is to determine whether the majority of 12-13 year olds have cross-dominance between their dominant hand and eye, and whether males or females are more commonly cross-dominant.

Methods/Materials
I tested 50 human subjects in the same order of procedure. Each one would come in, write their name on a sheet of paper, and look through a kaleidoscope. I observed and recorded their sex, dominant hand, and dominant eye. If they had used the hand and eye on the same side, they were not cross-dominant. If the dominant hand and eye were on opposite sides, they were cross-dominant.

Results
Out of the 50 subjects, 15(30%) were cross-dominant and 35(70%) were not. Out of the 15 cross-dominant subjects, 6 were male and 9 were female.

Conclusions/Discussion
In the beginning, I hypothesized that most people would have hand/eye dominance on the same side of the body. I was correct in that manner, but not about boys being more cross-dominant than girls, as the majority of the cross-dominant subjects were female.

Summary Statement
My project is based on the correlation of hand/eye dominance.

Help Received
My family helped me narrow down to a specific question out of a list I created researching dominance of the eye.