



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Peter Aoun; Timothy Jones</b>	<b>Project Number</b> <b>S0301</b>
<b>Project Title</b> <b>Mus musculus domesticus Exposed to Mozart, PHASE II: Time-Lapse Effects on Spatial-Temporal Reasoning</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Our Phase I results last year demonstrated a significant Mozart Effect in mice. Initial studies indicated that active participation is necessary to attain this. We propose to test whether the effect will be present after a time lapse. The ultimate goal is to pinpoint the longevity of the Mozart Effect and determine if precise exposure to the complexities of Mozart might, due to the neuroplasticity of the brain, lead to long-lasting neurophysiological changes. Also, we want to ascertain whether the Mozart effect is unique to the complex compositions of Mozart.</p> <p><b>Methods/Materials</b> 40 newly weaned mice were divided into 2 listening groups and exposed to either Mozart or Beethoven for 12 hours per day during their active phase, for a period of 10 weeks. 15 from each group were randomly selected as permanent trial subjects and tested in a classic T-shape maze over a 5-day examination period. Each mouse performed 3 trials per day, totaling 15 per subject, after a 6-hour lapse in music exposure. The working time and errors, indicating spatial-temporal learning, were recorded and analyzed.</p> <p><b>Results</b> Statistical analyses of subject performance indicate that the difference in their working time and errors is extremely statistically significant, with Mozart mice performing faster and with fewer errors. The Mozart results were compared statistically with the results from our Phase I Mozart mice, and the difference in working time was very statistically significant, indicating that this year's subjects had a shorter working time. Analyzing the errors found no significant differences.</p> <p><b>Conclusions/Discussion</b> The time-lapse did not negatively affect the performance of the mice, suggesting further studies with longer time-lapses, seeking optimal exposure time. The Mozart mice outperformed the Beethoven mice significantly, however, the Beethoven mice (exposed at a younger age and for a longer period of time) learned at approximately the same rate as our Phase I Mozart mice. This indicates that the Mozart Effect lasts at least several hours, that it is not necessarily limited to Mozart compositions, and that earlier and/or prolonged exposure will result in improved learning. Our hypothesis was correct: spatial-temporal performance improved despite the time-lapse between auditory stimulation and performance. The <i>Mus musculus domesticus</i> exposed to Mozart exhibited greater learning than those exposed to Beethoven.</p>	
<b>Summary Statement</b> Our Phase II study tests the effects of a time lapse on the spatial-temporal abilities of <i>Mus musculus domesticus</i> (laboratory mice) exposed to Mozart or Beethoven, represented by their performance in a standard maze.	
<b>Help Received</b> None.	



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<b>Name(s)</b> <b>Reinhart D. Arquiza</b>	<b>Project Number</b> <b>S0302</b>
<b>Project Title</b> <b>Does Group Cohesion Correlate with Performance in High School Classrooms?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The main objective is to determine if there is a correlation between group cohesion and performance in high school classrooms.</p> <p><b>Methods/Materials</b> A cohesion questionnaire was developed and administered to eight classes, one college- prep math and english class for each grade- (209 students). The classes' performance was measured on their last school- issued progress report grades. Spearman's Rank Coefficient was used to see if there was a correlation between cohesion and performance.</p> <p><b>Results</b> Spearman's Rank Coefficient gave a 98 percent level of confidence that there is a correlation between group cohesion and performance to a statistically significant degree.</p> <p><b>Conclusions/Discussion</b> Based on the eight classes tested, group cohesion does correlate with performance.</p>	
<b>Summary Statement</b> An effort to find a correlation between group cohesion and performance in high school classrooms was achieved.	
<b>Help Received</b> The following teachers allowed me to administer my surveys to their classes: Mr. Burgreen, Ms. Curtis, Ms. Hardaway, Mr. Love, and Ms. Neel. Following teachers provided the necessary materials to administer my survey: Mr. Castro and Mr. Case. The following families provided me with their resources	



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<b>Name(s)</b> <b>Annick Aubin-Pouliot</b>	<b>Project Number</b> <b>S0303</b>
<b>Project Title</b> <b>Brain, Mathematics, and Languages: Impact of the Timing of English Learning on Mental Activities Performed by Bilinguals</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Humans possess the important ability to communicate and perform mental activities by using elaborate language. Bilingual people have the option to perform those activities in different languages. What language is the bilingual person most likely to count it? The objective of this work is to see if there is a correlation between the languages used to perform mental activities and the moment English was learned.</p> <p><b>Methods/Materials</b> A group of 57 randomly selected bilingual persons living in an English environment (the San Francisco Bay Area), with English as their second language, were asked to answer a series of language related questions.</p> <p><b>Results</b> First language (other than English) is strictly used to dream, think and perform mental calculations in a proportion of 15, 28, and 62% respectively. The proportion of people performing mental calculations in their first language decreases with the duration of the time spent in the English environment: 86%, 66% and approximately 50 % for a length of stay of less than 5 years, 5 to 10 years, and more than 10 years, respectively.</p> <p><b>Conclusions/Discussion</b> Among the three mental activities, to dream, think and perform mental calculations, the latter requires the longest time in an English environment to be done in English. At any stage, when people perform mental calculation in their second language, the other activities are also done in this language. The moment of English exposure plays an important role to determine the language used to perform mental calculations later in life.</p>	
<b>Summary Statement</b> The correlation between the language used to perform mental calculations and the time the second language was learned and the length of stay in an English-speaking environment, while comparing it to dreaming and thinking.	
<b>Help Received</b> Father overviewed and corrected my work.	



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2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>David G. Blauvelt</b>	<b>Project Number</b> <b>S0304</b>
<b>Project Title</b> <b>Concentration Experimentation</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective was to investigate if rock music affects the ability of adolescents to learn and perform mental tasks. If so, which form of learning is most affected by rock music? Is reading comprehension, problem solving, or memory affected the most, and is it in a beneficial or detrimental way? <b>Methods/Materials</b> Various tests including reading comprehension, problem solving, and memory were given to over 100 adolescents aging from 13 to 21 years old. Each type of test was given twice, once with music and once without music. The results were then compared to find the test type with the greatest average difference under the two conditions. <b>Results</b> When all students were included, the results on average were slightly worse with rock music for reading comprehension but enhanced for memory. Looking at gender as a subcategory, girls were strongly affected by rock music, with music impairing reading comprehension and problem solving while helping memory. Music was not found to have a significant impact on the results for boys. Another factor was whether or not students normally study with music. Music had a larger effect on those who normally study with music than those who normally study in silence. <b>Conclusions/Discussion</b> In general, the results suggest that rock music doesn't hurt mental activity much because the overall scores with music were not much lower than the overall scores without music. In fact, memory was enhanced by rock music. Surprisingly, the results were significantly different depending upon gender and study habits. Although the sample size (108 subjects) was fairly large and nearly fit a standard bell, some results were inconclusive because the uncertainties were large.	
<b>Summary Statement</b> Does rock music affect the ability of adolescents to learn and perform mental tasks?	
<b>Help Received</b> Used two teachers' classes to gather some of the data.	



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<b>Name(s)</b> Chris J. Bonser	<b>Project Number</b> <b>S0305</b>
<b>Project Title</b> <b>Statistical Analysis of Computer Based Learning vs. Traditional Learning</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The Objective of my project Statistical Analysis of Computer Based Learning Vs. Traditional Learning is to compare the test scores of students on computers versus students in a traditional learning environment. <b>Methods/Materials</b> This project used a website which I made and an identical copy of the website just in lecture/note format to compare the learning of the 3 groups. <b>Results</b> I found that students on computers with the aid of teachers outperformed students with teachers and students on computers. However students on computers outperformed students with teachers. <b>Conclusions/Discussion</b> The reason I think the computer enhanced learning is because it was an interactive tool that "spiced" learning up.	
<b>Summary Statement</b> My project compares the learning of students on computers versus the learning of students in a traditional learning environment.	
<b>Help Received</b> Mr. Miranda Mrs. Schuster and Mrs. Newton let me use their classes to gather data.	



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2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Roxanne S. Gibson</b>	<b>Project Number</b> <b>S0306</b>
<b>Project Title</b> <b>Correlation between Human Laterality and Visual Direction Tendencies</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this experiment was to observe whether left-handed people prefer to look towards the right rather than the left. The test was designed to determine if there is a correlation between the direction people initially look and their dominant hand. It was believed that the people who are right-handed would look to the left and the people who are left-handed would look to the right. <b>Methods/Materials</b> A computer program was developed to display two groups of random pictures on a computer screen for a short period of time. The groups of pictures were situated on the far right and far left of the screen. After the pictures were briefly displayed, the subjects were asked to write down what they saw on the screen. This data was transferred onto a grid sheet and evaluated. <b>Results</b> Fifty percent of the left-handed test subjects looked right and the other fifty percent looked left. Unlike the left-handed subjects, the right-handed subjects looked to the left 75% of the time. <b>Conclusions/Discussion</b> These results were inconclusive due to the small number of left-handed test subjects. Even though the experiment lacked left-handed people, there was a trend worth taking note of and this experiment should be continued.	
<b>Summary Statement</b> The purpose of this experiment was to observe whether left-handed people prefer to look towards the right rather than the left.	
<b>Help Received</b> Grandmother helped me implement and test the computer program used for the experiment.	



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<b>Name(s)</b> <b>Ashley Hall; Kayla Williams; Faith Yu</b>	<b>Project Number</b> <b>S0307</b>
<b>Project Title</b> <b>Semi-Sweet Dreams: A Study of Human Perception</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Our project aims to answer the question of whether or not subliminal messages affect people's thoughts. We want to determine how well the subliminal message affects a person's ability to perform on a multiple choice test of unknown facts. During the course of our project we would also like to find out whether or not gender makes a difference when testing the subliminal messages.</p> <p><b>Methods/Materials</b> We made two tests with 25 random facts on both tests. We recorded the facts of both tests onto 2 separate CD's. We then selected 12 random test subjects, 6 boys and 6 girls. We took 3 boys and 3 girls and put them into a control group(group B). Then we took the other 3 boys and 3 girls and put them into a group that will be actually tested(group A). None of them were informed that there were any difference between their grouping. While sleeping, we played our first CD to test group A for 6 hours and only said we played the CD to test group B. We monitored every group for 6 hours during the night by 3 hour shifts in order to stop the CD if they awakened. In the morning, each test subject was given a glass of orange juice and then given the test. They were monitored during the test and not allowed to discuss answers. We then repeated the experiment following the same procedure, but switched the people in the 2 test groups. The people in test group A were put into group B and vice versa.</p> <p><b>Results</b> At the conclusion of our experiment we found that there is no correlation between gender and the affect of the subliminal messages. We also concluded that subliminal messaging does have an affect on people's thoughts. The improvement between our control group and our test group in the 1st phase had an average of 6 points. In the 2nd phase we switched our test subjects and put them in opposite groups. The improvement between our 2 groups in the 2nd phase had an average of 7 points.</p> <p><b>Conclusions/Discussion</b> We concluded from our experimentation that subliminal messages do effect people's thoughts and there is no correlation between gender.</p>	
<b>Summary Statement</b> Our Project was to see if subliminal messages do, in fact, have an effect on human thoughts.	
<b>Help Received</b> Parents put forth money, parents provided our house as the controlled environment.	



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<b>Name(s)</b> <b>Laura A. Huppert</b>	<b>Project Number</b> <b>S0308</b>
<b>Project Title</b> <b>Shape vs. Color: Which Is the Primary Perception?</b>	
<b>Objectives/Goals</b> The objective of this experiment is to determine whether individuals notice shape or color first. My hypothesis is that most subject's primary perception will be based on color as opposed to shape.	
<b>Abstract</b> <b>Methods/Materials</b> Informed consent was obtained from 100 randomly selected people, 50 men and 50 women in three selected locations. In order to test the hypothesis, a set of playing cards was used that contained a trick card: a heart playing card with the hearts colored black. A consistent testing environment was maintained throughout experimentation by controlling unwanted variables such as the lighting, card order, and the angle at which the cards were displayed to the subjects. As the set of cards was flipped through, the subjects were asked to identify the suit of each card as they were presented. When the subjects named the suit of the trick card, it revealed what their mind noticed first, shape or color, often without their conscious realization. The subjects that responded by saying "hearts" noticed the shape of the black heart first while those that responded by saying either "spades" or "clubs" noticed the color of the black heart first.	
<b>Results</b> When only one trick card was inserted into the set of playing cards, 70% of the women called the trick card a heart, indicating that they noticed the shape of the suit before the color. 54% of the men tested noticed the shape first, calling the trick card a heart. When three cards were inserted into the set of playing cards, most subjects called all three trick cards the same suit, indicating that their initial perceptions were consistent. Overall, the majority of the 100 subjects noticed shape before color in both the one- and three-trick card tests.	
<b>Conclusions/Discussion</b> My conclusion for this experiment is that most subjects notice shape before color, and more women than men noticed shape first. The data collected suggests that the designers of advertisements, web pages, and safety signs should concentrate on employing the use of shape effectively because most people have a primary response to shape perception.	
<b>Summary Statement</b> My project tested whether individuals notice shape or color first by using a set of playing cards that contained a trick card.	
<b>Help Received</b> None	





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<b>Name(s)</b> Caitlin A. Killmer	<b>Project Number</b> <b>S0309</b>
<b>Project Title</b> <b>Pushing the Limit: The Limit of Short-Term Memory in Adolescents</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project was to find out adolescent's ability to remember two-syllable nouns. <b>Methods/Materials</b> I made five lists of two syllable nouns. The first had three words, the second had five words, the third list had seven words, the fourth list had nine words, and the last list had eleven words. I gave these tests 88 times, in two different orders. In both trials, the subjects had fifteen seconds to look at the list, then flipped it over and immediately wrote down all the words they could remember. <b>Results</b> I found that the limits of short-term memory of two syllable nouns in adolescents is 5, plus or minus two. I found that 50 percent of people could remember 3 words, and 50 percent of people could remember between 4 and 5 words. In the seven, nine, and eleven word tests, fifty percent of people remembered between 4 and 7 words. <b>Conclusions/Discussion</b> I have concluded that adolescents can remember between 3 and 7 two-syllable nouns. My results contradict my hypothesis, which was based on the research of George Miller, who found that 7, plus or minus two, was the number of things a person could store and retrieve in their short-term memories. I think the difference in our results is because I tested only adolescents (people between the ages of 11 and 17,) and George Miller tested adults.	
<b>Summary Statement</b> I tested the short-term memory capacity of adolescents using two-syllable nouns.	
<b>Help Received</b> My math teacher, Clint Smith, helped me make graphs. My science teachers, Sunny LeMoine and Colin Matheson, helped edit the written components of my project.	



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<b>Name(s)</b> Natasha Krause; Devin Strzok	<b>Project Number</b> <b>S0310</b>
<b>Project Title</b> <b>What Do You Know About Genetics? A Study of How Age, Gender, and Educational Level Affect Knowledge of Genetics</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this research was to determine some of the common misconceptions about genetic knowledge in order to illustrate the need for additional research and expand and update curriculum in genetics. <b>Methods/Materials</b> We came up with a variety of questions related to genetics, some are old wives tales' and some are facts. We created a web site and posted these questions. The site was <a href="http://www.geocities.com/navforce2003m">www.geocities.com/navforce2003m</a> . We requested responses from a variety of home-school and neighborhood newsgroups as well as state and national 4-H groups. We also left fliers asking for responses at our school, UC Riverside and with our parents' co-workers. The responses were printed, graded and logged in a Microsoft Excel database, and these results were then summarized into charts and graphs. <b>Results</b> Our research shows that women with Bachelor's Degrees scored better than the other groups, even men and women with Master's Degrees and PhD's who scored lower than anticipated. <b>Conclusions/Discussion</b> Our results indicate that no one gender or educational level displayed a thorough knowledge of the subject matter, even at the basic level we tested. This gap between knowledge and the current applications of genetic engineering should be explored in more detail.	
<b>Summary Statement</b> How gender and education levels contribute to people's knowledge of genetics.	
<b>Help Received</b> Friend provided instruction in constructing web site and mothers provided advise & guidance in database analysis and construction of board.	



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2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Aida E. Kuzucan</b>	<b>Project Number</b> <b>S0311</b>
<b>Project Title</b> <b>Judging a Person by Their Hue</b>	
<b>Objectives/Goals</b> My objective is to see whether or not the colors one wears has an affect on the first impression they give to others.	
<b>Abstract</b>	
<b>Methods/Materials</b> Materials: 1 Digital camera with an adapter allowing you to transfer pictures to your computer 1 Working Computer with enough memory to work photo shop pro 1 Program that allows you to manipulate pictures on a computer (i.e.: Photo Shop Pro) 1 Male (Age 16-20) with no obvious physical deformities 1 Female(Age 16-20) with no obvious physical deformities 2 Plain white T-shirts ( with no logos) 2 Solid colored pants ( one for the boy and one for the girl) 1 colored Printer 200 People willing to sit for 5 minutes and take a survey	
<b>Procedure</b> A. Have both the male and the female put on one plain white T-shirt (with no logo) and one pair of solid colored pants. B. Use you Digital camera to take one picture of the male and one picture of the female. make sure there is a sufficient amount of light so that the pictures won't be too dark. C. Use the adapter and connect your Digital camera to your computer. D. Transfer the pictures to your computer by pulling up the pictures under the program called PhotoShop Pro (or any other picture altering program) E. Change both the male's and female's shirts to the same 5 unique colors by tracing the shirts with your mouse and the picking the colors under edit. *Remember to save each individual picture after you create it. You should end up with 10 new pictures. F. Print out the 10 pictures on your colored Printer. G. Show the pictures one by one and ask question about what the 200 people you test think about the personality of the person in the picture.	
<b>Results</b> 99.5% of people are influenced by color during their first interaction.	
<b>Summary Statement</b> Seeing whether or not color had an effect on first impressions and if so what did 5 colors specifically say.	
<b>Help Received</b> My mother financed the project. Oto godfrey helped with the computer. Arti Ayer helped me find my question. Ms. fusco gave me the oppertunity to do my project.	



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<b>Name(s)</b> <b>Brittany A. Loft</b>	<b>Project Number</b> <b>S0312</b>
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**Project Title**  
**Techno vs. Old School**

**Abstract**

**Objectives/Goals**  
The purpose of this report is to determine if students can learn better through internet-based learning methods or hands-on materials.

**Methods/Materials**

- 30 students from La Reina High School
  - 5 girls from the 7th grade
  - 5 girls from the 8th grade
  - 5 girls from the 9th grade
  - 5 girls from the 10th grade
  - 5 girls from the 11th grade
  - 5 girls from the 12th grade
- a map of the united states for each student and each testing.
- The web site for the internet-based method.
- The book with the map inside to learn from it.

**Results**  
All of the identified groups, all female grades 7th through 12th, had varied test scores.

Final Trial Results:  
The average percentage per grade with each method of learning:

Grades	Book %	Internet %
The 7th Grade-	59%	70%
The 8th Grade-	55%	64%
The 9th Grade-	52%	46%
The 10th Grade-	88%	84%
The 11th Grade-	65%	70%

**Summary Statement**  
My project is based on whether students have better leaning abilit through the internet or through text books.

**Help Received**



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<b>Name(s)</b> <b>Megan E.B. Miller</b>	<b>Project Number</b> <b>S0313</b>
<b>Project Title</b> <b>The Effect of Driving on Freeways on Blood Pressure</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to determine if the length of time spent driving on freeways affects the driver's blood pressure, causing it to go up or down. I believe that the stress caused by driving will cause the blood pressure to go up as the time spent driving increases. <b>Methods/Materials</b> Using a standard blood pressure cuff and a stethoscope, the blood pressure of 4 people was measured at 15,30,and 60 minute intervals while driving. The test was repeated 3 times on each subject. The mean of the average blood pressure was calculated and trends were noted. <b>Results</b> The data did not show a big change in blood pressure. In the interval from 15 to 60 minutes blood pressure stayed within 1 point of the 15 minute pressure in 2 people, blood pressure went up 5 points in 1 person, and down 5 points in the 4th person. <b>Conclusions/Discussion</b> There were not significant changes in the blood pressure of the subjects. The study did not support the hypothesis that blood pressure would go up under the stress of driving. It would be interesting to see if the blood pressure would change more dramatically if the tests were done during commute traffic or with other stressors such as children in the car, radios or cell phones were added.	
<b>Summary Statement</b> This project is designed to see if the stress of driving on freeways can affect the blood pressure of drivers.	
<b>Help Received</b> I had 4 people help me with my project. My mom, my dad, my uncle, and my aunt let me test them. My mother taught me how to measure a blood pressure and let me use her stethoscope and blood pressure cuff. My dad helped me with the computer data graphs. My mom helped me edit my report.	



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<b>Name(s)</b> <b>Kyasha E. Moore</b>	<b>Project Number</b> <b>S0314</b>
<b>Project Title</b> <b>Subliminal Messages</b>	
<b>Objectives/Goals</b> The purpose of the project was to see if subliminal messages are successful. And if so, are they more effective with girls or boys. Since subliminal messages are powerful, and can be secretly used, today they are banned in some countries, such as Russia.	
<b>Abstract</b> For the project I first looked for a subliminal message kit. Since none of these kits are guaranteed, a friend made the compact disc with the subliminal messages. Many websites were visited, there were discussions with the psychology teacher, and with other students in order to figure out the best way to conduct the project. Data was collected from the students at Branch Elementary. In the control group of 20 students 85% of the students chose green, 15% chose yellow, and only 10% chose red. Control Group A proved that red was the least popular color, so the color red was put on the compact disc for the 1st, 2nd, and 3rd experimental groups. In Control Group B with 16 students yellow was not chosen. Red was picked 44% of the time, and green was chosen 56% of the time. So in turn yellow was the color used with experimental groups 4, 5, and 6. And in Control Group C with 7 students yellow was chosen 14% of the time, green 57% of the time, and red was chosen 29% of the time.	
<b>Methods/Materials</b> For the project I first looked for a subliminal message kit. Since none of these kits are guaranteed, a friend made the compact disc with the subliminal messages. Many websites were visited, there were discussions with the psychology teacher, and with other students in order to figure out the best way to conduct the project. Data was collected from the students at Branch Elementary. In the control group of 20 students 85% of the students chose green, 15% chose yellow, and only 10% chose red. Control Group A proved that red was the least popular color, so the color red was put on the compact disc for the 1st, 2nd, and 3rd experimental groups. In Control Group B with 16 students yellow was not chosen. Red was picked 44% of the time, and green was chosen 56% of the time. So in turn yellow was the color used with experimental groups 4, 5, and 6. And in Control Group C with 7 students yellow was chosen 14% of the time, green 57% of the time, and red was chosen 29% of the time.	
<b>Results</b> With the data collected from the experimental groups it has become apparent that the percentage of children that chose red has dramatically increased. Experiment Group 1 chose 33% red, Experiment Group 2 chose 60% red, and Experiment Group 3 chose 50% red. These percentages are compared to the 10% that chose red in Control Group A. When the experiment was conducted a second time yellow was only chosen 12.5% in Experiment Group 4, 6% in Experiment Group 5, and 6% in Experimental Group 6, compared with being chosen 0 times in Control Group B. The third and final time the experiment was conducted showed results of 14% yellow in Control Group C, 26% yellow in experimental group 7, 18% in Experimental Group 8, and 5% in Experimental Group 9.	
<b>Conclusions/Discussion</b> The above data suggests that subliminal messages do work 24% of the time. In elementary age girls the subliminal messages work 26% of the time. In elementary age boys the messages only work 14% of the time.	
<b>Summary Statement</b> This project tests how susceptible elementary -age children are to subliminal messages.	
<b>Help Received</b> Students and teachers at Branch Elementary helped by participating in experiment.. My father helped me design my graphs.	



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<b>Name(s)</b> <b>Kimberlee M. Moses</b>	<b>Project Number</b> <b>S0315</b>
<b>Project Title</b> <b>Caffeinated Typing</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My project was to determine what effects does caffeine have on a person's typing speed and accuracy. I believe that the female subjects will increase in their words per minute and errors and decrease in accuracy after consuming caffeine. <b>Methods/Materials</b> Two typing tests were devised and made of equal difficulty. 16 volunteers of the same age and weight range were found for the experiment (8 females and 8 males). The volunteers took a pre-test. The words per minute, accuracy, and errors of the volunteers were tested and recorded before they drank caffeine. The test was timed for 3 minutes. 8 volunteers, 4 males and 4 females, then drank decaffienated Diet Pepsi and the other 8, 4 males and 4 females, drank caffeinated Diet Pepsi. The volunteers did not know which kind of Pepsi they were drinking at the time. The volunteers waited 30 minutes and then took the second 3 minute typing test. After the test, the words per minute, accuracy and errors were recorded, averaged out, and compared. <b>Results</b> The females increased in words per minute and errors. The males increased in words per minute and errors as well, but not as much as the females. <b>Conclusions/Discussion</b> In conclusion, my hypothesis was right. The females increased in words per minute and errors more so than the males. I conclude that females may have a faster metabolism and the caffeine works quicker. I also conclude that people who work as typists should avoid caffeine before work if their employers prefer quality over quantity.	
<b>Summary Statement</b> My project is about determining how caffeine consumption effects a person's typing speed and frequency of errors.	
<b>Help Received</b> My mother helped me the most with buying certain materials I needed and being there when I conducted the experiments. The student volunteers were from Jamestown Elementary School.	



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<b>Name(s)</b> <b>Stacey Mulligan; Nonafaye Williams</b>	<b>Project Number</b> <b>S0316</b>
<b>Project Title</b> <b>Flying Factors: The Study of Women in Aviation and the General Flying Capabilities of Males vs. Females</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> As students of a school located on an Air Force base as prestigious as ours, catching a glimpse of military pilots numerous times a day is common. After visiting NASA for the first time and testing out the flight simulators, we brainstormed and decided to research female pilots in the military. We found that females' acceptance into pilot training school is still some what rare, so we decided to form an experiment which would test the flying aptitude of males versus females. Due to present information that is in the male's favor, and generally greater video game experience, we predict that males will excel in this experiment.</p> <p><b>Methods/Materials</b> After receiving permission from the NASA security, we were able to test fifteen males and fifteen females on the F-18 Flight Simulator at NASA Headquarters on Edwards Air Force Base. After having each participant fly on the simulators five times each (each try is two minutes long), we took a careful analysis of their flying abilities, including landing (which is most difficult). The testing also included a short survey of the test subject's flying/video game experience.</p> <p><b>Results</b> After ending our vigorous experiments of fifteen test subjects from each sex (thirty in all), males have shown to excel on the flight simulators. Each male participant showed more consistency during each flight; while each female participant had shown great improvement throughout the testing. We noticed that each sex did share one trait-they showed the ability to learn from their previous mistakes and clean them up during the subsequent tests. After reviewing each survey (taken before testing) and comparing them to their overall performance, we had noticed that video game experience was not a variable factor in the experiment. Also, having previously flown on flight simulators did not make much of a difference on their flying capabilities.</p> <p><b>Conclusions/Discussion</b> Today, we realize, although, males have shown superior performance; females have shown a great deal of improvement compared to males. After careful research, factors that had once held back female pilots are no longer an aspect because in the end (due to enhanced training), females prove to show somewhat equal performances compared to males.</p>	
<b>Summary Statement</b> Testing the flying aptitude of males versus females by using flight simulators and carefully analyzing their flying abilities, including landing (which is most difficult).	
<b>Help Received</b> Mr. Donald Logan chaperoned at NASA and provided instructions on the usage of flight simulators; Mr. Barr took Mr. Logan's place when he was absent.	





**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Audrey K. Pahmer</b>	<b>Project Number</b> <b>S0317</b>
<b>Project Title</b> <b>How Does Color Affect Blood Pressure?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to see which colors affected blood pressure and in what way. I tested the colors red, green, yellow, and blue. I believe that exposing people to red and yellow will increase their blood pressure, whereas, exposing them to blue and green will decrease their blood pressure.</p> <p><b>Methods/Materials</b> 5 Cardboard boxes size 36x36x36. 48 cubic feet. 5 Plastic table covers (40.5 sq ft each) in white, blue, green, yellow, and red. 5 Wooden stools to put inside box for people to sit on during test. 1 Stop watch 1 Automatic Digital Blood Pressure Monitor. "OMRON" Made by the American Heart Association.</p> <p>I tested 30 people by putting them in large, cardboard boxes that I constructed, completely surrounded in each of the colors: red, green, blue, yellow, and clear/white. Each person, (between the age of 15-50), was first put into the white box, (which was the control), and their blood pressure was taken after spending two minutes inside the box. Next, they randomly selected, (out of a hat), what colored box they would go in next. After a five-minute break, they were placed into the next box for two minutes and their blood pressure was again taken. This was repeated until each person had been tested in all five boxes. I only measure systolic blood pressure.</p> <p><b>Results</b> The color red and yellow increased blood pressure, whereas green decreased the blood pressure. Blue had no significant effect.</p> <p><b>Conclusions/Discussion</b> As I had hypothesized, red and yellow increased blood pressure, while green decreased it. However, my hypothesis was incorrect for blue. Blue did not decrease the blood pressure. It only went up or down few units but remained the same as the control most of the time. I also did a hypothesis test of significance comparing the mean of each color to my control in order to see if my results were significantly significant. I found out that red, green, and yellow were all significant, (at the .05 alpha level), but, blue was not statistically significant in the difference of means.</p>	
<b>Summary Statement</b> My project is to see whether colors can really affect blood pressure, and in what way.	
<b>Help Received</b> I received no help at all in doing this project.	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>David J. Park</b>	<b>Project Number</b> <b>S0318</b>
<b>Project Title</b> <b>Differences in Perceptions of Health Between Japanese American and White Older Adults</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The aims of this study were to: (1) find if the Japanese American older adults (mainly Nisei # second generation) report better health status than the White older adults given the similar levels of medical health conditions (2) assess and find other factors influencing self-reports of personal health.</p> <p><b>Methods/Materials</b> The three questionnaires and surveys (SF-36, Medical History Questionnaire, and Screening Questionnaire, respectively) were given to all the elderly subjects for the research. In addition, the personal interviews were adapted from the three questionnaires and administered to a sample of ten elderly subjects at the Keiro Retirement Home. Construct validity of the research was assessed by calculating the correlation between the number of medical conditions (Japanese American, White) and the self-report in a three scale (E/VG/G, Fair, Poor).</p> <p><b>Results</b> In general, the analysis revealed positive reliability and validity for most of the items in the medical history and SF-36 questionnaires, with items within the vitality, social function, and general health scales requiring further review under a larger pool of random (non-selected) subjects. Yet, the results conflict with the initial beliefs that Japanese American older adults reported better health status than White older adults, which concluded that since the White older adults of more medical conditions rated their health as fair, our findings may be a result of the sampling samples of Japanese-American and White older adults not possibly reflecting the larger population of these older adults.</p> <p><b>Conclusions/Discussion</b> Given similar levels of medical conditions, we think, contrary to the hypothesis, the White older adults of more medical conditions rated their health as fair, which was similar to the Japanese American older adults. However, when given 3 medical conditions, only approximately 24 % of the White older adults reported their health condition as "fair" while almost three-fourths of the Japanese American older adults reported their health condition as fair. It shows from this random group sample that in a population of Japanese American older adults the self-reporting of the health status is tended to report more towards a "fair" status than either poor or excellent (very good).</p>	
<b>Summary Statement</b> To understand the concept of self-reporting health status between the Japanese- American and the White older adults, we must compare the individual's perception of functional status and well-being, as well as the medical history.	
<b>Help Received</b>	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jocelyn E. Roux</b>	<b>Project Number</b> <b>S0319</b>
<b>Project Title</b> <b>The Eating Disorders Project 2002: Phase One</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my project is to explore the impact of variables such as race, gender, or school environment on the rate of occurrence of eating disorders among adolescents in the United States.</p> <p><b>Methods/Materials</b> To acquire this information I asked over 2700 guidance counselors to distribute surveys in their respective high schools. I received a 7.5 % response rate, about 10,000 surveys. I had help from family and friends in both coding the answers into numerical values for the statistical analysis program and for data entry. To ensure consistency, each person was given instructions and a "code book" containing my procedures, and examples. Phase One, which included designing a database for the information and training my family and friends to code and enter data, was completed in February, 2003, with a total of 2300 surveys. Phase Two, to be completed in November, 2003, will include the rest of the 10,000 surveys.</p> <p><b>Results</b> Several trends emerged from Phase One data. A generally accepted statistic is that 10% of those affected by eating disorders are male. In my study, I found 13% of those with eating disorders to be male, indicating a possible rise in eating disorders within that population. In addition, an alarming 2% of males and 10% of females surveyed had or had had an eating disorder. My findings included that early onset of puberty doubled the chance of the participant's having an eating disorder, that people with a family history of eating disorders do have a higher rate of occurrence, and that the Body Mass Index (a ratio of height to weight) of those with eating disorders were less than a pound's difference from those without eating disorders (indicating that those with eating disorders are often not underweight, a common misconception).</p> <p><b>Conclusions/Discussion</b> The data from my project gives new evidence to support several current theories, disproves stereotypes that prevent those suffering from an eating disorder from seeking help, and provides a uniquely large and varied database of information on eating disorders.</p>	
<b>Summary Statement</b> My project seeks to discover which variables may/may not have an impact on the occurrence of eating disorders among adolescents in the United States.	
<b>Help Received</b> Friends and family helped to code surveys and do data entry (which I supervised and/or personally explained and provided instructions for), and a friend taught me how to use SPSS, a statistical analysis program which I used for analyzing the data.	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Lul H. Tesfai</b>	<b>Project Number</b> <b>S0320</b>
<b>Project Title</b> <b>Pictorial Devices and Their Ability to Mnemonically Enhance the Human Memory</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective is to determine if the use of pictorial devices are effective in mnemonically enhancing the short-term and long-term human memory. Through my experimentation I hope to test the impact mnemonic devices actually have on the human brain and whether they significantly improve memory over an extended period of time.</p> <p><b>Methods/Materials</b> Informed consent was obtained from 200 randomly selected people, 100 women and 100 men ranging from age 14 to 18 years. I constructed my controlled variable, which consisted of two sets of 15 cards, with one displaying the Geez text and a and one with simply the Geez text, and a set of 30 cards containing the original 15 cards and 15 other cards displaying the Geez text. The male and female subjects were divided into groups of two depending on gender and then then divided into Group 1, which was tested with the picture and the text, and Group 2, which was tested with simply the text. The participants were first shown either the first section of cards or the second and then the assortment of thirty cards and asked to respond "yes" if they believed that the card they viewed was in the original section or "no" if believed the card was not. After counting the number of "yes" and "no" responses and the number of correct and incorrect answers, I proceed to interpret the data.</p> <p><b>Results</b> Group 1 males and females remembered substantially more than Group 2 males and females. Group 1 females were able to retain 43% of the information, and Group 1 males were able to retain 46%, while Group 2 females were able to recall 33% and Group 2 males were able to recall 30%.</p> <p><b>Conclusions/Discussion</b> Due to the fact that Group 1 viewed an image along with a text, they were able to visualize and comprehend the figure they viewed. In these teenagers tested, pictorial devices were effective in mnemonically enhancing the short-term memory. Despite the fact that the text the participants viewed was in another language, which they had never seen, the participants did surprisingly well. Group 1 seemed to make ties between the picture and the text, making it easier to identify the text the second time they saw it, where as Group 2 focused on the first couple letters of the text, making it difficult to identify the correct texts.</p>	
<b>Summary Statement</b> My project tests the effectiveness of pictorial devices in mnemonically enhancing the short-term and long-term human memory.	
<b>Help Received</b> Father helped in organizing the Geez font; Mother helped in translating Geez font; Mr. Peck supervised the project; Mr. Levy provided for the essential information pertaining to the school, county, and state level science fair	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Nicole I. Toussaint</b>	<b>Project Number</b> <b>S0321</b>
<b>Project Title</b> <b>Diabetes and Depression: The Assessment of Depressive Symptoms in African-American and Hispanic Women</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b></p> <ul style="list-style-type: none"><li>a. To determine the prevalence of depressive symptoms in Hispanic and African American women.</li><li>b. To determine if a difference is prevalent in depressive symptoms between diabetic and non-diabetic women.</li><li>c. To determine if a difference is prevalent in depressive symptoms between African-American and Hispanic diabetic and non-diabetic women.</li></ul> <p><b>Methods/Materials</b></p> <p>The survey has been developed using several sources, which describe assessment of depressive symptoms, directed at women and diabetes depressive symptoms (18, 19, 20).</p> <p><b>Diabetic:</b> Women were recruited at the 4M Diabetes Clinic at KDMC. A flyer will be given to women that enter the clinic by the clerk regarding the survey. The principal investigator will have a flyer in the vitals rooms regarding the study so that patients can approach her to fill out the survey if they choose to. Women will then take the survey and fill it out in rooms while waiting for their doctor. The survey took about 10 minutes to complete.</p> <p><b>Non-diabetics:</b> The non-diabetic women will be surveyed from the KDMC's lobby, 4M, 4I, 4G, and 4H Internal Medicine clinics. The survey will take about 10 minutes to finish. For the Spanish speaking patients the same will be done as the "cases" survey.</p> <p><b>Results</b></p> <p>Descriptive analysis will be carried out using the Social Science SPSS, Version 10.0 (33). In all cases, <math>P &lt; 0.05</math> is considered to be statistically significant. There were differences in the education level of the women. 50% of diabetics completed elementary. 80% of non-diabetics completed high school. Diabetics had more co-morbid disease. Depressive symptoms were prominent in both Hispanic and African American women with diabetes. Diabetic women reported sleep deprivation. Non-diabetic group reported feelings of hopelessness, guilt, and worthlessness.</p> <p><b>Conclusions/Discussion</b></p> <p>Women with diabetes have more depressive symptoms than non-diabetic women. There are significant differences in depressive symptoms between Hispanic and African American women with diabetes. The</p>	
<b>Summary Statement</b> My project will determine whether or not there are greater prevalents of depressive symptoms in African-American and Hispanic women with diabetes or without diabetes.	
<b>Help Received</b> Advisor helped survey Hispanic Woman. Used 4M Diabetes Clinic at King/Drew Medical Center to survey women.	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Toni M. Ward</b>	<b>Project Number</b> <b>S0322</b>
<b>Project Title</b> <b>Does Age Maturity Matter? A Study to Determine if Age Maturity Affects the Student's Grade in the Classroom</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose was to determine if a first grader's developmental age will affect their percentages on their math and reading tests in their class. If a student has a low developmental age and is struggling to keep up their grades, it might be best to place the student in a more appropriate grade that is specially designed for their developmental age.</p> <p><b>Methods/Materials</b> Progress began by researching school-age children (the first few years of elementary school) and their age maturity. Then thirty-one first grade students at Bailey Elementary School were tested, using the Gesell School Readiness exam to determine each student's developmental age. All of the students' math and reading test scores were collected to compare with their developmental age.</p> <p><b>Results</b> 80% of the students that had a high developmental age (6 or 6 ½) also had high math and reading test scores while students with lower age developments had a lower grade than those with a higher age development. (Example: student 20 had the age maturity of a 6 ½ year old, being 6 years and 4 months and had a 100% on both math and reading tests. Student 17 had the age maturity of a 5 ½ year old, being 6 years and 8 months and had an 87% math score and a 44% reading score.) There were a few exceptions though. (Example: student 28 had the age maturity of a 5 ½ year old, being 6 years and 9 months but had a 100% on their math score and a 98% on their reading score. Student 12 had the age maturity of a 6 year old, being 7 years and 11 months and had a 98% on their math score but had a 62% on their reading score.)</p> <p><b>Conclusions/Discussion</b> For the most part, my hypothesis was correct. The student's developmental age did affect their math and reading grade in their class. 93% of the students are making a 90% or higher on their math test scores and 74% of the students are making a 90% or higher on their reading test scores, showing that, with a few exceptions, most of the first grade students are doing well (90% or higher on their math and reading test scores) considering the difference between their chronological age and their developmental age.</p>	
<b>Summary Statement</b> To determine if a student's developmental age will affect their math and reading test scores.	
<b>Help Received</b> used classroom at Bailey elementary school under the supervision of Kristie Grubb	



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Stephanie A. Williams</b>	<b>Project Number</b> <b>S0323</b>
<b>Project Title</b> <b>The Effects of Positive and Negative Space Reversal on Visual Perception in Children with and without Dyslexia Phase III</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The Purpose of this study was to determine if children between the ages of nine and twelve with dyslexia are able to read and understand with more accuracy passages presented when the positive and negative space is reversed (black background with white letters). It was hypothesized that the reading accuracy and comprehension of the dyslexic students would be improved with this reversal of positive and negative space.</p> <p><b>Methods/Materials</b> A test was created consisting of four paragraphs (two presented normally and two reversed) and two reading comprehension questions per passage. A total of 37 dyslexic students and 34 non-dyslexic students were tested. The students were given 90 seconds to read each passage, the reading comprehension questions were given and answered orally.</p> <p><b>Results</b> It was found that the dyslexic students made less errors when reading the passages presented on the black background. The reading comprehension of the dyslexic students was slightly improved by the reversal of the positive and negative space. The reversal of the positive and negative space had no effect on the dyslexic students reading accuracy or comprehension. A chi-square test was completed comparing the the black and white background reading accuracy for the dyslexic students. This test yielded a P-value of 3.46E-20 (a highly significant value). In addition, a Comparison of Two Means test was completed comparing the background color, this also yielded significant results. Finally a 99% Confidence Interval was established, from which it was be said with a 99% confidence that the mean reading errors of the dyslexic students will be 1.65 less when reading reversed passages.</p> <p><b>Conclusions/Discussion</b> Since both the reading accuracy and comprehension of the dyslexic students improved with the reversal of positive and negative space. Thus, it can be concluded that it is beneficial for dyslexic students to read passages presented when the positive and negative space is reversed.</p>	
<b>Summary Statement</b> The purpose of this study was to determine if the reversal of positive and negative space in paragraphs increases the reading accuracy and comprehension of dyslexic students.	
<b>Help Received</b> Mr. Steely helped edit my report, as did my mother.	



# CALIFORNIA STATE SCIENCE FAIR 2003 PROJECT SUMMARY

<b>Name(s)</b> Nicole M. Young	<b>Project Number</b> <b>S0324</b>
<b>Project Title</b> <b>The Correlation Between Facial Symmetry and Attractiveness</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My major goal for this project was to see if there is a relationship between facial symmetry and attractiveness.</p> <p><b>Methods/Materials</b> I started my experiment by using a digital camera, and photographing thirty random people of different ages and nationalities. I then downloaded them into the computer, using the program Adobe Photoshop 5.5. I inverted the right side of the face and superimposed it over the left, and vice versa. I ended up with three separate pictures: one of the original face, both right sides, and both left sides. Looking at all three pictures I categorized the pictures into "high degree of symmetry", "medium degree" and "low degree". I constructed my survey, based on this information, and pasted the thirty original faces onto a poster board in a random order. If the picture had a "one" next to it, then I considered the face very symmetrical, if it had a "two" on it, then the person had a medium degree of symmetry, and if it had a "three" on it, then the person had a low degree of symmetry. The people that I tested did not know what the numbers meant, and this was only for my information. I then had thirty random people take part in my survey. I showed the pictures to each subject, and asked them who they thought was the most attractive. On my data sheet, I recorded the person's age, and the number (one, two, or three) of the person's face that they chosen.</p> <p><b>Results</b> After recording all of the votes taken about the best looking face, I counted seventeen people (fifty seven percent) that chose a face from category one. Category one was the group of most symmetrical faces. Eight people chose the most attractive person from category two, and five from category three.</p> <p><b>Conclusions/Discussion</b> My results support my hypothesis, because fifty-seven percent of the people I surveyed voted the more symmetrical, the more attractive a face was. Symmetry and beauty are both subjective, and people may have a different opinion about the attractiveness of the same person. How this benefits people today, is the fact that surgeons in the field of plastic surgery must realize that symmetry can have an impact on attractiveness. Through my experience, I realized that science does not have to be proven by math, or by equations, science can be the study of human opinion. I have also learned that beauty is different in everyone's eyes.</p>	
<b>Summary Statement</b> My project supports the fact that there is a direct relationship between facial symmetry and attractiveness.	
<b>Help Received</b> friend taught me how to use program, Adobe Photoshop 5.5	