



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jazmin Aguilera; David Melendy; Kevin Wulf</b>	<b>Project Number</b> <b>S0301</b>
<b>Project Title</b> <b>Common Sense</b>	
<b>Abstract</b> <b>Objectives/Goals</b> In our experiment, Common Sense, we explore the concept of sensory input loss. Our problem: When deprived of a particular sensory input (hearing/vision) is the other sense reception heightened? Our experiment tests sensory deprivation in the short term, testing receptiveness with and with out the other sense in a matter of minutes, as explained in Methods and Materials. After some reaserch done beforehand, we formed our hypothesis: We believe that when the body is deprived of hearing or vision, in order to adapt, it will heighten the other sensory input.	
<b>Methods/Materials</b> Materials: * 1 eye chart; * 1 measuring tape; * 1 audio track of voiced numbers, words, and letters; * 1 audio track of noise distraction; * 1 blindfold; * 1 pair of earmuffs and earplugs; * 1 silent visual distraction movie; * 20 human subjects; * 20 result sheets. Methods 1)Subject's hearing is tested while watching a visual distration with the audio track of numbers/letters/words. Subject must repeat what s/he hears. Score is recorded 2)Subjects vision is tested with an audio distration using eye chart and audio distration. Score is recorded 3)Both tests are repeated, substituting audio and visual distrations with earplugs and a blindfold	
<b>Results</b> Our data shows that the loss of one sense may improve the reception of another. The data we collected shows there may be an improvement in hearing when the sense of sight is absent. In the case of vision however, no definite relationship between loss of hearing and better vision was observed.	
<b>Conclusions/Discussion</b> These results partially support our previously stated hypothesis. Our hypothesis was correct in that our data shows there is an improvement in hearing when the sense of sight is absent, however does not support our predictions about loss of hearing. Nevertheless, our experiment could have been improved in several areas. Our margin of error consisted of errors such as the lighting of the room in which we tested our subject, and the clarity of the voice on the audio track of words/numbers/letters. Studies such as these could improve society by extending our understanding of handicapped lifestyles. Additionally, it could improve things like standardized testing conditions so that students# opportunity to channel their focus into one area and other similar situations. This information could also be useful in today's technological world when studying cell phone use while driving a car.	
<b>Summary Statement</b> Our project is about whether or not one's hearing enhances when vision is taken away and vice versa.	
<b>Help Received</b> Mr. Murbach helped us with the statistic formula, David casterson helped provide us with an eye chart	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Erik J. Aidukas</b>	<b>Project Number</b> <b>S0302</b>
<b>Project Title</b> <b>The Effect of Anonymous Testing on Teenage Boys' Hand Washing</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this study was to determine if teenage boys would have measurably cleaner hands if they knew they would be anonymously tested for cleanliness. It was hypothesized that if teenage boys knew that they were being tested for cleanliness, then the presence of microbial growth would be significantly less than boys who did not perceive that they were being tested for cleanliness, even though the swabbed boys who knew that they were being tested also knew that they would never be associated with their sample. <b>Methods/Materials</b> Twenty-six boys saw the observer and experimentation setup. Another 19 boys did not see the observer or experimentation setup. Sterile swabs were used to sample the boys' hands and were swabbed on to agar in petri dishes and incubated for a period of 47 hours. Additionally, 50 teenage boys gave their age and answered a five-question survey about hand washing. Such questions were used to eliminate uncontrolled variables such as peer pressure and to cross validate the results of the swab test. <b>Results</b> The results of the swab test were measured in $\text{cm}^2$ of microbial growth. The average of the boys tested inside the bathroom was 8.5 with a standard deviation of 5.79, and the boys outside was 22.7 with a standard deviation of 9.67. A two-sample t test of the difference between the means revealed a t value of 5.55 and a p value of $3.33 \times 10^{-7}$ , proving high significance. In two survey questions, 80% of respondents said that they would not change their hand washing if their friends were present. When asked how thoroughly they would wash their hands in a situation like the experiment, 56% said they would wash about the same as always, with 42% consciously saying they would wash more thoroughly. <b>Conclusions/Discussion</b> The results supported the hypothesis that even if test results are not linked to a subject, teenage boys wash their hands more thoroughly when observed. Possible errors may have resulted from the sterility of the petri dishes or the inability to accurately measure the hand washing effort put forth by the tested. Further research could test other ages and girls or test in other socially desirable areas.	
<b>Summary Statement</b> Anonymous testing significantly motivated better hand washing.	
<b>Help Received</b> Westlake High School teachers reviewed writeup; Mother helped type report; Father helped with display.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Pallavi Bekal</b>	<b>Project Number</b> <b>S0303</b>
<b>Project Title</b> <b>Correlation Between Perfect Pitch and Age, Gender, Ethnicity, and Musical Background</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project is to find out what percentage of the population could sing on pitch, and if it would be dependent on the age, gender, ethnicity, or musical background of the subjects.</p> <p><b>Methods/Materials</b> Materials: Sabine chromatic tuner, questionnaire, and 80 volunteers. I tested my experiment by having my subjects complete a questionnaire that asked for their age, ethnicity, gender, and whether or not they have a musical background. Then, I played a recording of three notes (C,B,G) and had the subjects listen to each note one at a time. Then, they were asked to sing each note individually while I recorded the frequency of the note on the tuner.</p> <p><b>Results</b> Females: 20% sang perfect. Males: 22% perfect. Age 10&amp; under: 29% sang perfect. Age 11-20: 32% sang perfect. Age 21-30: 6% sang perfect. Age 31-44: 22% sang perfect. Age 45-65: 7% sang perfect. Age above 65: 0% sang perfect.</p> <p><b>Conclusions/Discussion</b> Based on my data from my experiment, I have concluded that ethnicity, age, and musical background are all factors in determining whether or not one has perfect pitch. Gender is not a factor.</p>	
<b>Summary Statement</b> My project's #1 goal is determining what factors affect perfect pitch.	
<b>Help Received</b> I would like to give a huge thanks to my family who drove me to many houses to obtain volunteers for my experiment.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Eric A. Brandon</b>	<b>Project Number</b> <b>S0304</b>
<b>Project Title</b> <b>The Glass Is Half Full: The Effect of Age on Optimism</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The goal of the project is to determine whether or not the age of a person has an effect on their "Total Optimism" score on Dr. Martin Seligman's optimism scale. The result of the experiment would also relate to the validity of the concept of "Learned Optimism"</p> <p><b>Methods/Materials</b> There were three age groups for the experiment: teenage (13-19), adult (20-59) and senior citizens (60+). I gave 20 people in each age group the optimism test, designed by Dr. Martin Seligman, Ph.D. It has 48 questions, 8 on each of the six main sub-divisions of optimism which combine to form the Total Optimism score. The Total Optimism score is what I used to determine overall optimism or pessimism.</p> <p><b>Results</b> I found three significant trends in the data: 1) Teenagers are far more pessimistic than adults and seniors, who scored about the same, 2) Teenagers had a far smaller range of scores in most of the sub-divisions of optimism, and 3) All three age groups averaged a score of "Very Pessimistic." These results caused me to reject my hypothesis that the oldest group would be the least optimistic.</p> <p><b>Conclusions/Discussion</b> I believe that the explanations for all three of these trends lie in the concept of learned optimism. Learned optimism is the idea that a person's life experience plays a role in making a person optimistic or pessimistic. It is likely the pessimism is caused by teenagers learning of and facing situations for which they are not ready. The smaller range of scores in teenagers is probably because they have not had as many life experiences which may cause their optimism levels to change and therefore making the range larger. The overall pessimism may be a result of the general negative social climate of the world we live in. These results indicate that learned optimism is a large factor in determining our overall optimism.</p>	
<b>Summary Statement</b> The purpose of the project is to determine whether or not a person's optimism levels vary with age.	
<b>Help Received</b> My Grandma gave surveys to her senior friends and my family helped me score the 60+ surveys I used.	



# CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

<b>Name(s)</b> <b>John Tan Carin</b>	<b>Project Number</b> <b>S0305</b>
<b>Project Title</b> <b>Factors Affecting Adolescents' Short-Term Memory</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The goal is to determine the effect of visual and auditory distractions on short-term memory. Students will be asked to recall objects that were presented as words, pictures, and words plus pictures. A ringing cell phone and flashing light will be the distractions. Further more students will circle one memorization technique to determine the effects of strategies chosen according to the presentation form.</p> <p><b>Methods/Materials</b> High school students were tested to see how presentation forms affect short-term memory. Further more, they were exposed to visual or auditory distractions during the 30 seconds of recall. After each test they circled one memorization technique they used. The number of objects recalled was recorded, averaged, and compared for each presentation form and distraction. The materials used during the testing process were 8 1/2 X 11 presentation forms, stop watch, and types of memorization technique survey.</p> <p><b>Results</b> All three presentaion forms were affected by both visual and auditory distractions. However, visual and auditory distractions were irrelevant against memorization. Without distractions, the only notable improvement in short-term memory was for pictures compared to both: pictures were remembered better than both. Presentation form was more important when visual distraction was present: pictures were remembered notably better than words or both. Presentaion form was unable to overcome auditory distraction: all the presentation forms were drastically affected by the auditory distraction.</p> <p><b>Conclusions/Discussion</b> Pictures alone were remembered better than words or both. According to the analysis, pictures are more effectively remembered. This shows that words alone or both were a less effective form by which to present information. Students have a more difficult time deciding on a memory technique for both. Presenting both words and pictures pose a distraction in itself. Visual or auditory distraction impairs high school students# short-term memory. According to the analysis, all the presentation forms were affected by both distractions. The analysis also shows that visual and auditory distractions were equally effective in impairing short-term memory. The result of the testing for memorization techniques indicated that high school students already have the basic knowledge of what type of memorization technique to choose according to the presentation form.</p>	
<b>Summary Statement</b> Does visual and auditory distractions affect high school students short-term memory with with different types of presentation forms (words, pictures, and pictures with correlating words) and memorization technique surveys were distributed	
<b>Help Received</b> The Project advisor helped proof reading my materials: A friend helped out with the project title: A friend also helped with the organization of the project board	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Erika Aiza B. Carino</b>	<b>Project Number</b> <b>S0306</b>
<b>Project Title</b> <b>Effect of Driving Distractions on the Reaction Time of Students</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to determine if driving distractions, such as dialing on a cell phone or tuning a radio, have an effect on the reaction time of high school students. Furthermore, I want to determine if students with driving experience have a faster reaction time than those without driving experience. <b>Methods/Materials</b> 100 high school students, 50 experienced drivers and 50 inexperienced drivers, completed a computer program that measured their reaction time to the hundredth of a second. Students completed the program in four phases: practice, under no distractions, while dialing on cell phone, and while tuning a radio. Once the student hits the spacebar, a picture will pop up at a random time. That is the student's cue to press the space bar again as quickly as possible. Students are instructed to react to only 4 of the 5 pictures-the stop sign, the braking taillights of a car, the pedestrians and the stop light. When the picture of the billboard pops up, they are to NOT press the spacebar. Reaction times are recorded for every picture in the control and both experimental phases. Invalid reactions to the billboard are also recorded. <b>Results</b> The data obtained shows that the average reaction time of students when not distracted was .39 seconds. When dialing on a cell phone, their reaction time slowed down by an average of 56%. When tuning a radio their reaction time slowed down by an average of 45%. In regards to driving experience, t-tests show that there is no significant difference between students with and without driving experience. However, tuning a radio had far more of an effect on the reaction time of non-experienced drivers. This study also shows that students were more susceptible to an invalid reaction (reacting to the billboard) when distracted. <b>Conclusions/Discussion</b> This study shows that driving distractions do affect the reaction times of high school students and regardless of driving experience, the reaction time of students is still significantly affected.	
<b>Summary Statement</b> Students, with or without driving experience, completed a reaction time program to determine if driving distractions, such as dialing on a cell phone or tuning a radio, would have an effect on their reaction times	
<b>Help Received</b> Raymond Buckley created the Reaction Time Program; Mr. Linke provided the laptop; Josephine Carig provided the radio.	



**CALIFORNIA STATE SCIENCE FAIR  
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<b>Name(s)</b> <b>Jessica L. Chaisson</b>	<b>Project Number</b> <b>S0307</b>
<b>Project Title</b> <b>Influence of Art Instruction on the Academic Performance of Adolescents</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Even though art is not one of the core and mandatory subjects, according to many different educational literature and data, art is still important in that it helps students achieve in other subjects. Being an active art student for four years at Mount Miguel High School, it hit hard when the district started to cut back the arts. According to Mount Miguel High School budget records, the Art Department budget has been cut approximately in half since the 2003 - 2004 school year. There is a general sense among those associated with the Art Department that other academic areas are being emphasized in order to raise standardized test scores. This project is designed to test whether art instruction helps students succeed academically in other subject areas, specifically biology for this experiment. In addition, this project tests the effect of previous art instruction on the effectiveness of the art instruction that is presented during this study. <b>Methods/Materials</b> There are a total of five art projects taught to biology students during three units. Three classes were used as the experimental group, which was the group that receives the art instruction, and two classes were used as the control group. Both groups then completed the same tests and lab assignments to see whether the art projects helped them understand the biology concepts better and helped their academic achievement. <b>Results</b> The results of statistical analysis showed that art instruction did indeed help the students improve their academic achievement. <b>Conclusions/Discussion</b> When comparing the control group to the experimental group, there was a significant improvement in the tests and lab scores after the art lessons when compared to their past test scores. However, the results varied when comparing students who have had previous art instruction to the ones who have not. According the statistical analysis, the differences in the test and lab scores were not significant, but when comparing raw data, the non-art students showed larger increases in their scores, which again demonstrates the positive impact of my art lessons. Finally, there was no significant difference for the students with different amounts of art experience. However, the non-art students and the advanced art students showed a large increase in scores, which again verifies the effectiveness of the art lessons.	
<b>Summary Statement</b> To see whether art instruction helps students improve test scores in academic subjects, specifically biology, and to test the effect of previous art instruction on the effectiveness of the art lessons.	
<b>Help Received</b> Mr. Linke and Ms. Esquibel helped by letting me teach their classes; Mr. Linke helped edit my papers; Ms. Annicchiarico helped give me ideas for art lessons; friends helped me type and give practice lessons to them.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Elizabeth M. Conlan</b>	<b>Project Number</b> <b>S0308</b>
<b>Project Title</b> <b>Eye Spy: A "Handy" Game</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The goal of my project was to see if there was a difference in the number of hidden 3-D pictures('Magic Eye" pictures) right and left handed persons were able to see. <b>Methods/Materials</b> For my experiment I used 25 right handed persons and 25 left handed persons. I also used seven 3-D pictures(2 practice and 5 test pictures), pencils,pens, answer sheets for the subjects to write their answers on and a spreadsheet program to graph results <b>Results</b> Early testing, with 29 subjects, showed that left handed persons could see 2.2 pictures and right handed persons could see 1.5 pictures. However, further testing, with 50 subjects, revealed an even slighter difference. The second round of testing showed that left handed person could see 1.92 pictures and right handed persons could see 1.8 persons. I hope to contuine testing to further enhance my results and provide more accuracy. <b>Conclusions/Discussion</b> In conclusion, my hypothesis was supported by my data. I hypotheized that left handed persons would be able to see more pictures than right handed persons and there was a slight difference. Although the reults do show a slight difference in the number of pictures, there are so many variables when testing with humans, that I need to continue testing in hopes of further enhancing my results.	
<b>Summary Statement</b> My project tested right and left handed persons and their ability to see hidden 3-D pictures.	
<b>Help Received</b> My parents supplied materials and the board design.	





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2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Yaser Elashi</b>	<b>Project Number</b> <b>S0309</b>
<b>Project Title</b> <b>Are the Shades of Gray the Same?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My goal is to how and what the volunteer view, which is like an optical illusion only dealing with gray shades. But i many change some of this information. <b>Methods/Materials</b> Materials I have used 35 volunteers to tell me whether the gray shades were the same or not, and of course i used the illusions which there were three of. <b>Results</b> My results was that most of them had trouble figuring out the answer on average the girls did better. And alot knew the answer, and i mention in my reaserch why. <b>Conclusions/Discussion</b> My conclusion is that on average many people were undecided, and that they had difficulties.	
<b>Summary Statement</b> My project is about perception, and how gray shades can preform illusions hard to beleive.	
<b>Help Received</b> Father helped with some background information, Mother gathered me some useful information, teacher gave me some helpful points about how optical illusion occurs.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Helen C. Jackson	<b>Project Number</b> <b>S0310</b>
<b>Project Title</b> <b>The Backpack Pack: A Study of the Weight of Students Compared to the Weight of Their Backpacks</b>	
<b>Objectives/Goals</b> Each year millions of students walk around school carrying backpacks full of textbooks. This weight on their backs can cause acute and chronic aches and pains, which can eventually trigger serious back problems. This project is to determine what percentage of students from grades 3-12 carry backpacks that are too heavy for their body weight, according to the doctor recommended weight of 10-15% of their body mass. Is there a relationship between the gender and age of students compared to their backpack weight? Have students with heavy backpacks experienced back pain? Does the style of backpack, length of strap, or mode of transport to school affect the students back problems?	
<b>Abstract</b> <b>Methods/Materials</b> 213 students from grades 3-12 were tested. Students and their backpacks from local elementary, middle, and high school were weighed using scales. The gender, age, style of backpack, transportation to school, and previous back problems were recorded, along with the straps on their backpack being measured. The testing took place at different times of day on students from various classes over a period of 3 weeks	
<b>Results</b> The data show that there were more students in grades 6-9 whose backpack weight was over 10-15% of their body weight than in elementary and high school. The percentage tended to be low in grades 3-5, increasing in grades 6-9, and then decreasing again when students reached the 10th grade. There did not appear to be any correlation between the heaviness of female verses male backpacks, with the average female backpack percentage being 9.9% of their body weight and males being just a little less at 9.4%. No obvious relationship was noticeable between the mode of transport taken to school or length of backpack straps verses back pain problems experienced by students.	
<b>Conclusions/Discussion</b> The data did not entirely support what was originally predicted. From the 213 students tested, the overall average backpack verses body weight percentage did not exceed the doctor recommended weight. There were many students with heavy backpacks, but because of their individual body weight the ratio of backpack to body weight was not very high. Although there was no apparent correlation between backpack weight/strap length/mode of transport and previous back pain problems at school level, scientific testing and research has revealed that the pressure students put on their backs now may have serious effects in the future	
<b>Summary Statement</b> Comparing students backpack weight verses their body weight.	
<b>Help Received</b> None	



# CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

<b>Name(s)</b> <b>Keal D. Jones</b>	<b>Project Number</b> <b>S0311</b>
<b>Project Title</b> <b>Accuracy of Human Memory with Suggestive Input</b>	
<b>Abstract</b> <b>Objectives/Goals</b> By using misleading or suggestive statements and questions in this experiment, I have been able to demonstrate effects on human memory when participants try to recall events and images from a previously viewed video, narrative and photo. The purpose of this study was to determine the impact of leading questions and misleading narrative associated with a participants viewed images. <b>Methods/Materials</b> Intel Dual Core 3.2 GHz Pentium Computer, Microsoft Internet Information Server, Microsoft Access, Microsoft Excel. Experiments were conducted online. Experiment Video consisted of a brief introduction, a news video, a supportive or suggestive narrative and a 30 True/False statement questionnaire. There were three control groups. All answers were compiled into a data base for later analysis. Analysis was performed using the Microsoft Access and Excel programs. The second experiment was a photo and 20 questions. <b>Results</b> My analysis shows that memory is 5% to 10% less accurate when confronted with suggestive or misleading questions that are coupled with credible video and supportive or suggestive narrative text. Memory of video events was most accurate when there was no narrative text influence or retroactive interference. The overall accuracy rate of Experiment Video was: group A - 69.02%, group B - 67.53%, group C - 75.11%. In Experiment Photo the overall accuracy rate was 69.49%. All groups scored higher accuracy levels when answering suggestive questions! <b>Conclusions/Discussion</b> People had an ability to filter through the suggestive information so much as to more successfully answer the suggestive questions correctly than the non-suggestive questions. When confronted with suggestive input, human memory may be erroneously reconstructed. The credibility of a source affects accuracy levels. Suggestive narratives increase the misinformation effect. Recall of visual events may be less likely to be distorted than written stimulus. Eliminating misleading or suggestive information, credibility filtration, is more successful than accurately recalling non-suggestive credible information. Supportive narrative text accompanying a video image did not enhance the human memory to be more accurate as I expected. Human memory is most accurate with no other outside influences or retroactive interference.	
<b>Summary Statement</b> How accurate is human memory when confronted with suggestive input?	
<b>Help Received</b> Ethics advise Don Jones , BioMedical Ethics Professor, Drew University & Dr. Stan Bursten, Psychology Instructor at SBCC, computer programming advice from my father John Jones	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tanya R. Kandralyan</b>	<b>Project Number</b> <b>S0312</b>
<b>Project Title</b> <b>Cartoon Violence</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project is to demonstrate that male children are more influenced from the violence in cartoons compared to female children. This project also proves that male children perform much more violently after watching cartoons that contain a great amount of violence. The goal of this project is to inform adults and critics about how children, especially male children give off anger and tension from cartoons into their own real life, not knowing that a cartoon is not based on reality. This eventually affects the way they speak and the fashion in which they react to others in their future as adults. This project is to alert and request the cautiousness in our communities, because the children are our future, and whether we like to admit it or not, the basis of our future really comes from the media itself, such as the newspapers, television, or violent cartoons.	
<b>Methods/Materials</b> The materials used in with children in pre-kindergarten were crayons, papers, DVD#s which display violence, a video camera, and a television. During the experiments, seven girls and boys were utilized. Each group was given a period of ten to fifteen minutes to watch cartoons in which display violence. After this phase, the children were asked to draw anything they wished. The catch was that they all had to share a crayon or two. This way, it would be easy to distinguish if the violence in the cartoon had an effect on the female or male children.	
<b>Results</b> The male children demonstrated 268 violent actions during their time of drawing, and the female children demonstrated only 85 violent actions during their time of drawing.	
<b>Conclusions/Discussion</b> The hypothesis for this project was proven correct. The violence in cartoons does have a greater effect on male children compared to female children. Most cartoons have the wrong influence on children, especially boys, at a very young. The cartoons that are viewed by many children possess a huge impact in a child#s mind. Advertising and endorsing such immorality is not just encouraging future violence but promoting it to young girls and boys, that violence in cartoons is allowed and is not considered wrong. The environment needs to eliminate such thought and proceed with educational and non-violent cartoons for children, even if it would not sell. Promoting violence to innocent children should not be considered a method of business.	
<b>Summary Statement</b> This project is about how male children are much more influence by the violence in cartoons compared to female children.	
<b>Help Received</b> Student helped record the experminet on video camera.	



**CALIFORNIA STATE SCIENCE FAIR  
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<b>Name(s)</b> <b>Matthew D. Rongey</b>	<b>Project Number</b> <b>S0313</b>
<b>Project Title</b> <b>The Effect of Visual Subliminal Messages on Viewers' Color Choice</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment was to determine whether visual subliminal messages have any effect on viewers' color choice. <b>Methods/Materials</b> Three copies were made of a video clip. One clip was left alone, a red rectangle was inserted into one clip after every 10 seconds of video, and the word "RED" was inserted into the other clip after every 10 seconds of video. A website was created that consisted of a homepage that informed the participant of what he or she would be doing and had links to each video, a page that played the video and then redirected the participant to a form where the participant selected one of five colors and entered his or her demographic information, and a thank you page that explained the entire experiment to the participant and invited him or her to tell others to visit the website. <b>Results</b> As of this writing, of the 159 participants who watched the plain video, 73 selected blue, 9 selected white, 25 selected black, 23 selected red, and 29 selected green. Of the 171 participants who watched the video with a red box inserted into it, 71 selected blue, 11 selected white, 17 selected black, 41 selected red, and 31 selected green. Of the 124 participants who watched the video with the word "RED" inserted into it, 38 selected blue, 13 selected white, 13 selected black, 47 selected red, and 13 selected green. <b>Conclusions/Discussion</b> It was concluded that visual subliminal messages do have an effect on viewers' color choice. It was also found that visual subliminal messages containing words can be more effective than subliminal messages containing colors.	
<b>Summary Statement</b> This experiment determines whether a viewer's color choice is affected by seeing visual subliminal messages.	
<b>Help Received</b> My father and Steven Jacobson piqued my interest in subliminal messaging. Also, the over 454 people who participated in my experiment.	



# CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

<b>Name(s)</b> <b>Sabrina J. Russo</b>	<b>Project Number</b> <b>S0314</b>
<b>Project Title</b> <b>Correlations between Motion and Music: A Study of the Human Mind</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this Science Fair project is to determine whether the human mind classifies information based on pre-conceived notions, or archetypes. This is done by examining the human interviewee's interpretation of equine motion in relation to different types of musical meter.</p> <p><b>Methods/Materials</b> Video Camera, Notebook, Batteries, Equine test subjects, 20+ human test subjects, Video editing software, Computer, Sound clips (2/4, #, 4/4 meters), Headphones (for noisy environments) Setup: 1. Secure resources. 2. Prepare a section of the notebook for notes on variables. 3. Ensure computer software compatibility with camera. Eliminate irregularities in gaits for best test experience. Gather Data: 1. Setup video camera with clear view of the span of the arena. 2. Observe/Video the horses in natural gaits. 3. Take notes. 4. Acknowledge horses and owners for help. Making Tutorial: 1. Upload video to computer. 2. Create a simple tutorial using video editing software. 3. For each sound clip, insert a clip of each equine gait. 4. Create disc. Application: 1. Take tutorial to a public place with computer access. 2. Find and instruct WILLING subjects. 3. Stress ONLY music beats, but no further clues. 4. Show subject tutorial. 5. Thank subjects. 6. Plot results.</p> <p><b>Results</b> The results of this experiment show that the human mind actually tended to interpret equine motion and musical meter in different ways, depending on the individual's exposure to different experiences. Individuals with more musical or experience working with equines tended to relate musical meter with beat. Individuals with less of this exposure drew his/her own conclusions based on experience.</p> <p><b>Conclusions/Discussion</b> The ability to classify has helped the Human race survive. Detailed tests have been performed in the past to explore this field, esp. studies of the #archetype,# developed by Carl Jung (psychologist). Essentially, music is an auditory form of expression. The rhythmic beat of a horse can be considered music. I hypothesized that the information I gathered from my test subjects would curve around a certain definition of music. However, this information was proved to be inaccurate. Through this experiment, I learned that interpretation of motion and music is a developed trait. It changes based on experience, and that experience influences conscious decisions made by each individual.</p>	
<b>Summary Statement</b> This project is designed to test the way a human mind associates music with motion by comparing sound clips and videos of equines in motion.	
<b>Help Received</b> Mother helped proofread and format essay ; Father and Brother helped with tech support and proofreading, extra information on archetypes provided by Mr. Robel (teacher of English H-1)	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Sarah T. Silverstein	<b>Project Number</b> <b>S0315</b>
<b>Project Title</b> <b>A Longitudinal Study of Stress in Dental Students: Year 2</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Life changes and daily hassles lead to stress. This longitudinal study tests the hypotheses that stress in first year dental students will negatively affect performance and health, and that the amount and sources of stress will change over time. <b>Methods/Materials</b> 12 US dental schools were contacted; 4 participated. Students completed the Dental Environment Stress (DES) scale, Perceived Stress Scale (PSS), Stress Rating and demographic questions at the start of school (Time 1), 11.7 weeks later (Time 2), and 1 year later (Time 3) when first year GPA, illnesses, health ratings, and frequency of symptoms were also assessed. <b>Results</b> Of 407 first year students, 296 (186 men, 110 women) responded at Times 1 and 3; 205 responded at all three times. Stress scores were negatively correlated with GPA ( $p=.006$ for DES; $p=.042$ for PSS; $p=.002$ for stress rating) and with physical and emotional health ratings ( $p<.002$ ), but positively associated with numbers illnesses ( $p<.05$ ), symptoms ( $p<.0001$ ) and frequency of most symptoms ( $p<.05$ ). Stress scores were higher at Time3 than Time 1 ( $p<.0001$ for DES; $p=.0004$ for PSS), and varied between schools ( $p<.0001$ ). Women ( $p<.01$ ), younger ( $p<.003$ ) and single students ( $p<.03$ ) had higher stress scores at Time 1, but not at Time 3. Ratings for DES items related to school work were high at Time 1 and increased at Time 3 ( $p<.0001$ ). DES items related to school atmosphere had low ratings at Time 1 but had large increases over time ( $p<.0001$ ). Personal factors had low stress ratings both times. <b>Conclusions/Discussion</b> My hypotheses were supported. Stress had detrimental effects on performance and health. Stress increased over time; variation between schools may reflect different teaching methods. Sources of stress changed with the school atmosphere increasing in importance over time, possibly reflecting the different contributions of anticipatory and situational stress. First year dental students may benefit from stress reduction programs.	
<b>Summary Statement</b> My project examines how stress in first year dental students affects their performance and health, and how stress changes over time.	
<b>Help Received</b> Dr. Stephen Wotman, Dr. James Lalumandier, Mr. Philip Aftoora, Dr. Craig Yarborough, Dr. Richard Simonson, Mr. Wilson Leung, and Dr. Charles Shuler administered surveys.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Wendy Y. Su	<b>Project Number</b> <b>S0316</b>
<b>Project Title</b> <b>Contingent Color/Edge Adaptation: McCollough Effect</b>	
<b>Objectives/Goals</b> This experiment is set out to test: 1. The non-interocular quality of non-contingent, short-lived rapid color aftereffects of second long stimulation, thus proving contingent phenomenon of the McCollough Effect and 2. The strength of the effect in regards to the condition of myopia.  If the McCollough Effect is dissimilar from a short-lived, transient eye after-effect, the edge detectors that are responsible for ME should locate past the optic chiasm, where the convergence of the inputs of the two eyes occurs. Age and eye conditions should not have any effect on the occurrence of the effect, but might affect the strength of the after-effect.	
<b>Abstract</b>  <b>Methods/Materials</b> Microsoft PowerPoint program, Adobe Photoshop 7.0, Stop Watch/Timer, Volunteers Procedure: 1. Record eye condition of each human subject (myopia, hyperopia, astigmatism, ect.) 2. Have the human subjects cover one eye and view the magenta grating for 30 seconds and record results. 3. Allow the volunteer to be exposed to the gratings (3 seconds each, alternately) for five minutes 4. Record what color fringes the volunteers can see on the test gratings 5. Ask the volunteer they he/she takes in caffeine or certain drugs on a daily basis. 6. Continue this test for 20-30 human volunteers.	
<b>Results</b> The strength of the McCollough effect does not connect with the volunteer#s eye conditions. All volunteers indiscriminately could see the effect in some form.	
<b>Conclusions/Discussion</b> The McCollough effect is a contingent color/edge effect that originates from visual systems past the optical chiasm and thus, is not effected by retinal adaptation.	
<b>Summary Statement</b> The interocular quality of the McCollough Effect is proven through its indiscriminate adaptive quality in all volunteers despite their retinal condition of myopia.	
<b>Help Received</b> N/A	





**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Nanami A. Sunaga</b>	<b>Project Number</b> <b>S0317</b>
<b>Project Title</b> <b>Mozart Effect During Spatial-Temporal Testing</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The cortical firing patterns used in spatial-temporal reasoning are strikingly similar to the patterns used in Mozart's music. This phenomenon introduces the "Mozart Effect," or the prediction that Mozart's music has a causal relationship to higher brain functions, such as spatial-temporal reasoning. Most studies on the Mozart Effect have all focused on the Mozart music's after-effects--the enhancement of one's spatial-temporal abilities. However, there has been little or no research on the effects of the music during spatial-temporal tasks. Therefore, it was significant to measure the change in spatial-temporal reasoning abilities while listening to Mozart. The results would help prove whether there is indeed a causal relationship between Mozart's music and spatial-temporal reasoning in the brain.</p> <p><b>Methods/Materials</b> Twenty-four high school musicians and Twenty-one nonmusicians were tested for effects of Mozart's music before or during a spatial-temporal reasoning test. The individuals were divided into three groups--the control, during-music group, and after-music group. All subjects first took a timed base test consisting of ten paper-cutting and folding problems. Then, each group took a second, similar timed test under their corresponding conditions. Results were based on the changes (improvement or no improvement) in scores and times.</p> <p><b>Results</b> Significantly, the after-music group performed much more quickly than the during-music group, as was predicted. In addition, the changes in scores of each group followed the trends found in previous Mozart Effect studies#those who listened to Mozart did improve their scores more than those who did not. Therefore, Mozart's music does appear to aid in spatial-temporal reasoning by stimulating the structurally similar cortical firing patterns of the brain.</p> <p><b>Conclusions/Discussion</b> The differences in scores between the groups could not be justified because chi-square tests did not yield a low enough p-value. However, the statistical test did prove the differences in time taken to be significant enough to support the hypothesis. It was determined that the during-music group took longer to complete the task than the after music group because of the predictions that music and spatial-temporal reasoning may be using similar firing patterns in the brain. Therefore, the experiment supported a causal relationship between Mozart's music and spatial-temporal reasoning.</p>	
<b>Summary Statement</b> Because past experiments have focused on the after-effects of Mozart's music on spatial-temporal reasoning, I tested for the effects of his music during spatial-temporal reasoning	
<b>Help Received</b> Mother drove me to buy supplies, mentor proofread my proposal	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Lily C. Viramontes</b>	<b>Project Number</b> <b>S0318</b>
<b>Project Title</b> <b>Short Term Memory: Girls vs. Boys</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My goal was to determine what types of short term memory, boys and girls could remember, and how much they would remember in total. <b>Methods/Materials</b> I used groups of between 10 and 15 students to test my theories, small pieces of paper with 10 pictures and written words on them for the students to memorize, and I also read Dr. Seuss aloud to the classes I tested. <b>Results</b> I averaged the scores for boys and girls for each test. I found that girls remembered an average of seven pictures, seven and one half written words, and seven words spoken aloud. I also found that the boys remembered an average of six pictures, six written words, and six spoken words. <b>Conclusions/Discussion</b> I found that in my small samples the girls remembered more than the boys on all the tests. This however does not mean that my tests were accurate: my sample size was fairly small and the differences between the number of words remembered were also fairly small. To determine whether the differences would be accurate in the real world I used a T-test to find the percentage that the results were significant. I found that only the written word test would have been statistically certain that the girls would do better, and although the others were very unlikely that the boys would do better I could not be certain.	
<b>Summary Statement</b> My project compared the short term memories of boys and girls.	
<b>Help Received</b> Mother helped with procedure, teachers let me come into classes to run tests, and math teacher helped with T-test.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kaitlin M. Walker</b>	<b>Project Number</b> <b>S0319</b>
<b>Project Title</b> <b>Perceptual Modalities: The Key to Increasing Performance</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To discover the link between matching preferred learning styles (visual, auditory,tactile)with corresponding teaching methods in order to assist students to perform better on memory tasks. To demonstrate the importance of considering a student's preferred learning style when deciding what teaching modality to utilize to maximize learning outcomes. I hypothesized that students would perform better on memory tasks when the teaching methods used to assist them matched their preferred learning style.</p> <p><b>Methods/Materials</b> I administered the Learning Style Inventory and the Checklist for Discovering Learning Channels to each of my 50 subjects. I scored the inventories to identify the preferred learning style of each subject and recorded the data. I developed 3 random lists of 15 memory word items to be used as memorization activities. For the control, I showed each subject the list of random words for a period of 1 minute. I recorded the number of words recalled for each of the 3 lists without any training. Next, I trained the subjects for 2 minutes using a visual strategy. The subjects had 1 minute to recall and write the words. I recorded the data and repeated the process using the auditory and tactile teaching strategies. For the tactile strategy, students put Popsicle sticks with matching words on a corresponding sheet. I compared the results for each teaching technique to determine which strategy produced the highest memorization score for each subject.</p> <p><b>Results</b> Of the 50 subject, 25% were identified as auditory learners, 44% were visual, and 31% were tactile. 85% of the students who received training in their preferred modality made gains in their ability to recall random words from the list of 15 items. The results of my data supported my hypothesis. Only 6 of the subject's ability to recall items decreased after being exposed to a certain training modality. 3 out of these 6 may have been distracted by the tactile teaching strategy.</p> <p><b>Conclusions/Discussion</b> It would be necessary to conduct extensive research, over time,utilizing more difficult memorization/learning tasks to validate my results. Most people do have a dominant learning style that should be considered when teaching them to increase performance.</p>	
<b>Summary Statement</b> My project is about the importance of considering a student's preferred learning style when deciding what teaching modality to utilize in order to maximize learning outcomes.	
<b>Help Received</b> My classmates and students in the Ventura Adult Education vocational program served as subjects.	



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Andrea C. Wooding</b>	<b>Project Number</b> <b>S0320</b>
<b>Project Title</b> <b>See This!</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment is to see if illustrations enhance a child's comprehension of a reading passage, and if so which type of child, (struggling reader, average reader or advance reader), as categorized by the teacher, will benefit the most from the illustrations. <b>Methods/Materials</b> I first gave each child a passage without illustrations and they had 8 min. to read it. The child was then asked to answer 8 questions on what they just read and they had 6 min to complete the test. Next the child was given 8 min. to read a passage with accompanying illustrations . After the child finished they were asked to answer 8 questions on what they just read and had 6 min to complete the test. I tested 259 students in all from third, sixth and seventh grade. <b>Results</b> The struggling students, in third grade, had test scores that were improved by approximately 19% when provided illustrations, sixth grade by approximately 18% and seventh grade by 25%. The average students, in third grade, had test scores that were improved by approximately 17% when provided illustrations, sixth grade by approximately 13% and seventh grade by 20%. The advanced students, in third grade, had test scores that were improved by approximately 8% when provided illustrations, sixth grade by approximately 9% and seventh grade by 10%. The differences in test scores in each grade and category of students were larger than the variance in test scores. <b>Conclusions/Discussion</b> My hypothesis was correct, illustration do enhance children's test scores. Illustrations consistently improved all children's comprehension. The illustrations improved the struggling students comprehension the most. The illustrations also improved the average student's comprehension but not as greatly. Advanced students comprehension was only improved modestly. The illustrations helped the struggling students comprehend at the same level as the average students without illustrations. The advanced students have developed the skill to visualize which the struggling students have not. By providing illustrations all children might have a better opportunity to succeed.	
<b>Summary Statement</b> The purpose of this experiment is to determine if illustrations improve reading comprehension.	
<b>Help Received</b> none	