



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Nia Abbas; Prutha Mehta; Saadhya Singampalli	Project Number S0401
Project Title Monkey See, Monkey Do!	
Abstract Objectives/Goals The experiment that we conducted is different and more realistic than many others. Our experiment was an interactive scenario. It wasn't a survey so the subjects were exposed to indirect peer pressure and not expecting anything. When they were in the room they were seated like everyone else were and told it was a visual perception experiment. Methods/Materials We set up the room to where the actors or controled variables were ready to tell the wrong answer. The room was empty except for the subject and actors. We then showed them the line test and asked to match the line with one of the three options. The actors of course said the wrong answers to see if the subject would fall into the trap. In three parts, part one with boys and girl actors, part B with just boys and part C with just girls. Results Part A of the experiment (pressure from boys and girls actors) resulted in 17 out of the 40 (42.5%). From part A, 6/20 (30%) boys# answers were influenced and 11/20 (55%) girls# answers were influenced. From part A, 6/20 (30%) boys# answers were influenced and 11/20 (55%) girls# answers were influenced. Part B of the experiment (influence from ONLY Boys) resulted in 19/40 (47.5%) of the answers to partake into peer pressure. 7/20 (35%) girls# answers were pressured, and 12/20 (60%) boys# answers were influenced. Part C of the experiment (influence from ONLY girls) resulted in only 14/40(35%) answers to be influenced. 6/20 (30%) boys# answers were influenced whereas 8/20(40%) girls# answers were influenced. Conclusions/Discussion In part A the girls were more influenced by the boys and girls. In part B the boys were most influenced out of all the parts in comparison. In part C niether the boys nor girls showed much influnce. The results as a whole show most influence towards the boys vs. boys.	
Summary Statement To see which gender is more prone to give into peer pressure from other genders.	
Help Received We used a classroom at our school, but recieved no teacher aid. No parental aid was given either,	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Nikita Akkala	Project Number S0402
Project Title The Effect of Aromatherapy on Cognitive Ability	
Abstract Objectives/Goals Aromatherapy has been used around the world for various applications-- stress relief, increase in alertness, memory improvement, relaxation, and even mood enhancements. In my experiment, I tested the effect of aromatherapy on cognitive ability and brain activity. Afterward, I determined which aroma showed the most improvement in performance level. Methods/Materials I used mice in order to conduct this experiment, because mice and humans have closely related homology and genome structures. Plus, humans cause numerous excessive variables. In total, I used 20 mice. 80 trials were conducted. Each mouse ran through 4 mazes in 3 different aromas (Lavender, Rosemary, and Peppermint) and 1 control (no aroma). For every aroma, each mouse ran through 4 different maze designs, in order to avoid the mice remembrance of the maze design. Results Then, I compared the average amount of time it took for the mouse to run through the maze with Peppermint (91.26 seconds), Rosemary (88.46 seconds), and Lavender aroma (75.55 seconds), with the control (123.71 seconds). Conclusions/Discussion In the end, I determined that aromatherapy has a positive effect on cognitive ability and brain activity, and exposure to lavender aroma shows the most improvement in the performance level of humans and animals. Therefore, my data and results supported my hypothesis, and overall I met my objectives.	
Summary Statement This purpose of this project is to determine if aromatherapy has an effect on cognitive ability and to determine which aroma shows the highest improvement in performance level.	
Help Received Mother helped in cutting and pasting, Father helped in handling mice. Shailaja Kasibhatla was the qualified scientist/biologist that approved the project.	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Supriya A. Bhupathy	Project Number S0403
Project Title Scents and Sensibility: Do Classroom Scents Improve Academic Performance?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this study was to determine whether placing scents (citrus, rosemary, or sandalwood) in classrooms could improve student performance on mathematical (left-brain) and pattern (right-brain) based tests, and possible gender differences.</p> <p>Methods/Materials Materials used in this project included student Tests 1 and 2, reed diffusers with citrus, rosemary, or sandalwood scents, and the excel program and online calculators for statistical analysis. A total of 162 tests were administered to 4th and 5th grade students. Test 1 was administered to four classrooms. Then, reed diffusers were placed in three classrooms, and one class served as a control. After a week, all four classrooms completed Test 2. Data was gathered, tabulated and statistical analyses performed. A second rosemary trial was then performed.</p> <p>Results All four groups improved in their mean score from Test 1 to Test 2; however, paired t-test showed no significant improvement for citrus (p-value 0.2549), sandalwood (p-value 0.1237) and the control (p-value 0.1028). Rosemary showed almost significant improvement (p-value 0.0676). Therefore, a second trial was conducted, which showed a significant improvement (p-value of 0.0065). The data was further divided into left-brain and right-brain sections and males and females on which further statistical analyses were performed.</p> <p>Conclusions/Discussion This study showed that there was a significant improvement in test performance when rosemary scent was disseminated in classrooms as expected in the hypothesis. However, it was not possible to draw conclusions between left brain and right brain functions; additional analysis revealed possible inequality between the tests. Males improved in their test performance with the rosemary scent, which is different than hypothesized. To improve this study, Test 1 and Test 2 should be revised in a control group first to insure equal difficulty, and then the study should be repeated with multiple trials for each scent.</p>	
Summary Statement This study attempted to show that scents in the classroom could improve test-taking performance, which could then be extrapolated to other environments to improve productivity at home, school, or work.	
Help Received My parents helped me by obtaining materials and reviewing my paper and poster. They also drove me to and from the schools.	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Valentina Carrillo	Project Number S0404
Project Title Who Are You Behind the Wheel? What the Vehicle You Drive Says about You	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this study was to determine whether the level of compliance with driving laws is related to the type of vehicles people drive.</p> <p>Methods/Materials Vehicle and driver characteristics were selected for observation including color of vehicle, type of vehicle, and gender and age of driver. Driving laws selected for observation were making a complete stop at a stop sign or red stop light, and not using a cell phone or texting while driving. Several suburban locations were selected in order to get a good sample of vehicles including two shopping centers, a business park, and main road. Observations were conducted from within a vehicle at a safe distance in a nearby parking location. Video recordings were taken to assist in the tabulation of observations due to the large number of vehicles at many of the locations.</p> <p>Results Four colors of vehicles accounted for almost 50% of the vehicles that failed to make a complete stop at a stop sign or red light: silver (14%), white (14%), black (13%), and blue (7%). The types of vehicles that had the highest levels of non-compliance with driving laws (not making complete stop at stop sign or red light, or driving while talking on a cell phone or texting): pick-up trucks (80%), cars (76%), SUVs (70%), wagons (67%), and vans (57%). In addition, female drivers compared to males had a higher rate of non-compliance for both not making complete stops (71% versus 65%) and using a cell phone while driving (8% versus 2%).</p> <p>Conclusions/Discussion Vehicle characteristics such as color and type of vehicle were found to have a relationship with the level compliance with the driving laws observed. A future study in driver attitudes towards compliance with driving laws using survey data would be valuable to better understand why the vehicle characteristics relate the way they do to non-compliance. In addition, females were found to have a greater rate of non-compliance than males in the driving laws observed. This has some important implications for public television ads and how they need to be targeted to the particular gender if aimed at reducing the use of cell phone use while driving.</p>	
Summary Statement The purpose of this project is to better understand the relationship between vehicle and driver characteristics and compliance with driving laws.	
Help Received Advisor assisted as driver and with identification of vehicles until I became more familiar with this.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Patrick Casebolt; Charley Huang	Project Number S0405
Project Title Music and Memory: Is There a Connection?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals All high school and college students study for exams. Some students, whether musically talented or not, study with ambience around them. Many use classical music as a pathway to better memorization. Our experiment tested whether music can actually help the study and memorization process. We chose classical music for our experiment because most people with musical ability have played classical music more than any other genre of music. Classical music is also the genre of music that is least likely to be distracting to the listener like Metal or Rap music, and the lack of lyrics in the music we selected also produced less of a distraction for the test subjects.</p> <p>Methods/Materials We created two nearly identical PowerPoint presentations, both with three different tests, one with classical music playing and one without. The first test was based on algorithm and analyzed basic memory. For this test, we showed a string of randomly generated letters. The test subjects with musical or non-musical backgrounds then tried to memorize and write the letters down. The second test was a visual test in which we showed fifteen carefully selected clip art pictures of clearly recognizable, everyday objects. Our test subjects wrote down the names of the objects after having twenty seconds to memorize them. The third and final test checked reading comprehension memory. A paragraph of reading material was shown and our subjects answered a series of questions regarding the paragraph.</p> <p>Results Through our research and experimentation we found results that conclusively showed the effect of music on short term memorization. We concluded that listening to music did not measurably change the scores of either musical or non-musical students. However, it appeared that the scores were significantly better for all students with respect to reading comprehension, while being less favorable in the algorithm and visual portions when music was being played in the background.</p> <p>Conclusions/Discussion It appeared that listening to music did not improve concentration in memorizing pictures or other random objects. It in fact slightly weakened the ability to memorize. This means that music did not help in visual learning such as flashcards with pictures on them. It also did not help raw memorization of things like variables and formulas. However it did improve the reading comprehension and memorization of students when music is played.</p>	
Summary Statement The intent of this project was to find out whether listening to classical music changed the effectiveness of short term memory.	
Help Received Volunteer helpers watching over test subjects. Parents bought materials for the poster. Parent's laptop computer was used for testing.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Patrick J. Chang	Project Number S0406
Project Title The Proficiency of a Left Hander's Right Hand vs. the Proficiency of a Right Hander's Left Hand	
Abstract Objectives/Goals My objective was to determine if left handed people were more proficient with their right hand than right handed people with their left hand. Methods/Materials 30 left handed people and 30 right handed people were tested for the experiment. 2 pieces of paper were given to each test subject with 400 circles total. The test subjects wrote down whether they were left or right handed at the top of the paper along with what hand they started with. (half dominant, half recessive). Using a stopwatch, the test subjects were given 30 seconds to cross out as many circles as they could, going row by row with whatever hand they were assigned to start with. After 30 seconds had passed, the stopwatch was stopped, and the subjects then switched to their next hand. They skipped a line from where they had stopped crossing out circles from the first trial, and again, began to cross out as many circles as they could within 30 seconds when the stopwatch had started. The entire process was repeated two more times until the test subjects had their dominant hand tested 3 times and their recessive hand tested 3 times. The average amount of circles crossed were put in a ratio of dominant hand to recessive hand. Results Left handed people had a lower dominance ratio (the closer the ratio to 1, the better) and less percent deviation than right handed people. Conclusions/Discussion Based on these results, it was suggested that left handed people were more proficient with their right hand than right handed people with their left hand since they had a lower ratio and less percent deviation than right handed people.	
Summary Statement To determine if left handed people are more proficient with their right hand than right handed people with their left hand.	
Help Received Dad helped put board together; Teacher helped with the design of experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Andrew T. Clausen	Project Number S0407
Project Title Singers vs. Instrumentalists: A Study of Relative Pitch Sense	
Abstract Objectives/Goals The objective of this experiment was to determine whether singers or instrumental musicians would have a better sense of relative pitch - the ability to recognize distances between notes. Methods/Materials Subjects were given a test on both hearing and singing. The hearing test was comprised of a note written on a page and two notes being played. The subjects were asked to then name the interval between the notes or the name of the upper note. The singing test was the opposite, as two notes were written but only one note was played. The played note was the starting pitch (the first note) on the page, and subjects were asked to sing the second note on a page. A microphone attached to a tuner verified what note the subject sang. Responses were graded on a scale of 1-5, 5 being right, 3 being within a half step, and 1 completely wrong. Results Singers scored an average score of 3.7 +/- 1.7 on the hearing test and 3.8 +/- 0.7 on the singing test. Instrumentalists scored 2.8 +/- 1.2 on the first test and 2.5 +/- 1.1 on the second. While there is an overlap in the scores when the standard deviation is applied, a t-test gave a p-value of 0.003 for the hearing test and 0.0129 for the singing test. As $p < 0.05$, the t-test suggests that the two samples are indeed statistically different, which in turn suggests that singers do in fact have a better sense of relative pitch than instrumentalists. Conclusions/Discussion Since it is suggested by the data that singers do in fact have a better sense of relative pitch than instrumentalists, it can be assumed that it would be a good idea to implement more singing training in early musical education. If instrumentalists are taught how to sing as well, they will not only be more well-rounded, but the development of the skill of relative pitch will make them overall better musicians.	
Summary Statement This project tested if singers or instrumentalists have a better sense of relative pitch, which ability to recognize the distance between notes.	
Help Received General project consulting from advisor; statistics help from math teacher	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Kaila Corrington; Sneha Pang	Project Number S0408
Project Title Blasting Binaural Beats on the Brain	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of the experiment was to discover whether the effects of beta binaural beats on problem-solving ability could be altered by combining the frequencies with various controlled ambient noises, and if so, which ambient noises would produce the most significant effects.</p> <p>Methods/Materials Five, three-minute audio samples were generated. Four included the underlying beta binaural beat (three of which were layered with another ambient noise), and one was pure silence. A representative sampling of individuals from varying education backgrounds participated by completing as much as possible of a 100-problem, simple operations math worksheet while listening to each of the five tracks. The five different tests were collected and scored, awarding points for correct answers and including a guessing penalty. Necessary materials for this procedure included audio editing programs, audio samples, audio playing devices, headphones, headphone splitters (optional), math worksheets, a stopwatch, writing utensils, and the participants.</p> <p>Results The majority of participants performed best on the trials in which the binaural beat was merged with either lyrical music or the ambient noise of an environment typical to an outdoor shopping center. Overall, the average scores proved that the beta binaural beat could be best enhanced in combination with the shopping center ambient track or the lyrical music track, respectively. When the trial with the silent audio sample was administered, each participant exhibited their poorest performance of each of the five trials. The aforementioned trends were demonstrated at each tested education level.</p> <p>Conclusions/Discussion As revealed in the poor performance on the silent trials, the beta binaural beat assuredly has a positive effect on problem-solving performance. The extent of this effect can be enhanced by layering the frequencies with an ambient track, and while the results of different ambient tracks can vary between individuals, the overall trends suggested the ambient noise of a shopping center was most beneficial in conjunction with the beta beat. These trends signify the environments that individuals have become accustomed to concentrating within, and our results suggest that the most efficient studying habitat is one that combines the beta binaural beat with the ambient noises customary to everyday activities.</p>	
Summary Statement The experiment revealed the effects of beta binaural beats on problem-solving ability and how said effects could be enhanced by combining the frequencies with various controlled ambient noises.	
Help Received William Schlegel, Christopher Morgan, and Gregory Peck were all high school science teachers that offered their guidance to the experiment. A family friend assisted in preparing the wood for the project board.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) John M. Di Tomaso	Project Number S0409
Project Title The Effects of Texting Distractions on Driving Performance	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This is an experiment designed to investigate the effects of texting on driving performance, as measured by the mean time necessary to complete a 2.1 mile course using the driving simulator Test Drive Unlimited with the Xbox 360 gaming console.</p> <p>Methods/Materials The experimental group (n=26; 16 Females and 10 Males) and the control group (n=28; 14 Females and 14 Males) consisted of a randomized opportunity sample of 17-18 year old students from two 12th grade English classes. The participants were predominantly Caucasians from a rural high school in central California. The experiment was carried out during two class periods over two weeks with each participant completing a simulated driving course on a rural stretch of highway using the Xbox 360 driving wheel and foot pedal controls. The participants in the control group were requested to complete the driving course without texting distractions. The participants in the experimental group were asked to complete the same driving course while being required to respond to received text messages, each experimental participant responded to the standardized set, with regard to order and content, of text messages received in a serial pattern. The independent variable was the text messages received and responded to and the dependent variable was the amount of time necessary to complete the course.</p> <p>Results A one-tailed t-test demonstrated that there was significance at the $p < .000$ level showing that the recorded times were negatively influenced by the texting distractions at the 99.9% level of confidence.</p> <p>Conclusions/Discussion Serendipitous findings included no significant difference among gender, video gaming experience, texting experience, and with or without a driver's license. This suggests that texting while operating a motor vehicle negatively affects a person's ability to adequately perform driving skills. Drivers should be aware of the risks associated with texting</p>	
Summary Statement This is an experiment designed to investigate the effects of texting on driving performance, as measured by the mean time necessary to complete a 2.1 mile course using the driving simulator Test Drive Unlimited with the Xbox 360 gaming console	
Help Received N/A	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Clint Ellis; Jack Ellis	Project Number S0410
Project Title Do Shoppers Overspend at Costco?	
Abstract Objectives/Goals Our objective was to investigate whether or not anonymous shoppers overspend at Costco and by how much. Our hypothesis prior to conducting a brief survey was that the average anonymous shopper would overspend by \$50 on a typical visit caused by impulse/unplanned buying. Methods/Materials Informed consent was obtained from 102 randomly selected Costco shoppers on-site in San Luis Obispo, California over a five week period in January and February 2011. The shoppers were anonymous and were surveyed by the project team in order to determine their shopping behavior. The shoppers were asked if they came to Costco with a shopping list and what they thought they would spend relative what they actually spent. They were also asked if they had made any unplanned/impulse purchases. Results We found that 56 percent of the shoppers made a shopping list. We determined that the average (mean) of overspending was \$33 and the median was \$30 per shopper. We also found that 62 percent of the shoppers had made impulse purchases. The average (mean) spending per shopper was \$187. The standard deviation was \$104 which means that most of the shoppers probably spent between \$83 and \$291. The standard deviation of spending was 56 percent of the mean. Our sample size of 102 anonymous shoppers had a margin of error of 10 percent. We found that most anonymous shoppers were willing to participate in our survey. Conclusions/Discussion Our hypothesis turned out to be higher than our survey findings. Factors which may have affected the results were that the surveys were conducted one to two months after Christmas in a weak economy following the recession and that the primary employers in San Luis Obispo County are in the government, education and agricultural sectors. Our research focused on anonymous individuals where the researchers did not manipulate the subjects# behavior and the study did not involve more than minimal risk. Our survey did not involve gathering personal information, invasion of privacy or potential for emotional distress.	
Summary Statement Our project is about whether or not Costco shoppers overspend and if so by how much.	
Help Received Mom and dad for helping us get this project off the ground and driving us to Costco many times.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Juanita Fernandez; Ingrid E. Talavera-Gutierrez	Project Number S0411
Project Title Who Am I?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective is to distinguish how many of our peers have a clear sense of who they are using James Marcia's Four Adolescent Identity States. If an adolescent is an upperclassman, then he/she is more likely to have reached the Identity State of Achievement.</p> <p>Methods/Materials Our materials include, a self- created survey and approximately 200 human subjects. We distributed the surveys to several advisory classes ranging from 9th-12th grade levels. Depending of the individual's results, they were categorized into one of James Marcia's Four Adolescent Identity States. After all the surveys were received, the results were graphed by grade levels and then by gender.</p> <p>Results The results show the percentage that reached the Identity State of Achievement: Seniors-54% Juniors-30% Sophomores-40% Freshman-37%</p> <p>Conclusions/Discussion The hypothesis is not entirely correct. Seniors proved to have the highest percentage in the Identity State of Achievement, whereas the Juniors showed to have the lowest percentage. We expected a linear growth; however Juniors went against the pattern, due to external forces such as peer pressure. This project allows us to understand the several steps and various factors that lead to acquiring one's true identity such as one's relationship with parents, social class, and self- esteem.</p>	
Summary Statement Our project classifies our peers into the Four Adolescent Identity States by James Marcia using a self - created survey that explores several aspects of a person's individuality.	
Help Received Dr. Krapes explained the Identity Statues in depth, which allowed us to formulate our questions for our surveys.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Mary A. Flemming	Project Number S0412
Project Title Phonics vs. Whole Words: The Effects of Rearranging the Letters in a Word	
Objectives/Goals I am determining which the brain would use more when confused by rearranged words, Phonics or Whole Word Language. I will determine if rearranging the letters in a word affects a reader's ability to read at a normal pace, without mistakes.	
Abstract I am determining which the brain would use more when confused by rearranged words, Phonics or Whole Word Language. I will determine if rearranging the letters in a word affects a reader's ability to read at a normal pace, without mistakes.	
Methods/Materials Explain to the human subject what they will be asked to do. (The subject must read the test paragraph aloud & while they are doing this, they will be tested on 4 key things: 1) if they could be read the test paragraph at all 2) their accuracy 3) their fluency 4) whether they read using Phonics or Whole Word Language reading.) Materials used: Stopwatch Printer Computer with 'Microsoft Office' 100 human subjects A paper with the rearranged paragraph on it Page protectors Recording journal/data journal	
Results My hypotheses stated that the Minors would read using Phonics more and the Adults would read using Whole Word more, both age groups would have the same amount of people who could read the paragraph, the adults would make less mistakes, and the Minors would be slower when reading. Overall both age groups used Whole Word more, but the Minors did use Phonics more. The Minors had 5% of the people that couldn't read the paragraph, of which I didn't use their data to analyze the rest of my results. The Adults did make less mistakes, but I proved that Phonics caused more mistakes overall.	
Conclusions/Discussion While completing my project , I found that as much as we may be taught to read using Phonics when we are younger, as we get older we use Whole Word Language and eventually Phonics is useless.	
Summary Statement To determine if rearranging the letters in a word affects a reader's ability to read at a normal pace, without mistakes in the chosen reading system.	
Help Received	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Sara X.Z. Grzywacz	Project Number S0413
Project Title Effects of Shadows, Local Contrast, and Geometric Knowledge on Perceived Lightness	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To perceive the lightnesses of surfaces, the brain not only takes their luminances into account but also the scene context. The "checkershadow illusion" probes such contextual effects. In this illusion, a white square of a chessboard under a shadow appears lighter than a black square outside the shadow even if the luminance of the latter is higher than that of the former. This illusion has been hypothesized to arise from the local contrasts of the squares, the brain's knowledge of the chessboard geometry, or the knowledge that shadows darken surfaces. This study tested these three hypotheses.</p> <p>Methods/Materials The psychophysical point of subjective equality was measured in five human subjects as a function of the intensity of the shadow. The original images were photographed chessboards with or without a shadow. The shadow was extracted and manipulated with Photoshop, and the psychophysics performed with MATLAB.</p> <p>Results In the "checkershadow illusion" of this experiment, the luminance of the white square was 20% that of the black square when they appeared equally light. Manipulating the shadow to be physically unrealistic caused this percentage to increase to 30%. In turn, this percentage of subjective equality was increased to 55% when the local contextual intensities were also equalized. Therefore, even without shadow and local-context effects, the luminance of the white square was lower than that of the dark square when both appeared equally light.</p> <p>Conclusions/Discussion In conclusion, shadows, local contrasts, and geometrical knowledge all provide contextual information used in different degrees by the brain in the computation of lightness. A surprising result was that shadows were relatively unimportant as compared to the other tested image attributes in controlling the brain's perception of lightness. Local contrast and geometrical knowledge had much larger effects on this perception. It is exciting to see that the knowledge of a chessboard may affect such a fundamental property of the human visual system such as the perception of lightness. Chessboards are manmade structures that had no impact on the evolution of the brain. Thus, it can be concluded that the brain's processing of lightness undergoes perceptual learning for manmade structures.</p>	
Summary Statement By using psychophysical techniques, it was demonstrated that contextual information in images such as shadows, local contrasts, and geometric knowledge, affects how the brain perceives surface lightness.	
Help Received Dr. Norberto Grzywacz from USC advised me on the design of the project and taught me the use of Photoshop and MATLAB; Members of my family were the psychophysical subjects in the project; Mother helped with design of poster	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Trysha K. Hicks	Project Number S0414
Project Title Which Gender Do You See?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to test if people can determine the gender of a person based on only a picture of their eyes. Also, I am trying to discover if there is any significant correlation for people to accurately select genders based on other notable factors such as participant gender, age ranges, and ethnicity.</p> <p>Methods/Materials For this project, I constructed a flip book consisting of seventy-five pictures, and some of the pictures had eyebrows while others did not. The pictures came from a variety of sources, such as magazines, internet, and photos of solicited participants. The pictures are also a variety of ethnicities, ages, and genders. Then, I had thirty-eight individual people, who did not know the people in the pictures, look at the flip book. They recorded their results on a key that I created on excel. The key was numbered one to seventy-five and next to each number were boxes, either male or female. The participants who took the test were also of a variety in ethnicity, age, and gender.</p> <p>Results Overall, the data demonstrates that a person only has a 56.2% chance to guess the gender of a person correctly with only a picture of their eyes. In addition, male subjects were correctly identified more often than females, by both male and female participants. Also, the prime age for answering the most pictures correctly was twenty to thirty-nine years of age. Additionally, ethnicities had a greater chance of guessing the gender of all the pictures, instead of the pictures of people only of their same ethnicity.</p> <p>Conclusions/Discussion After analyzing the data, it was surprising that ethnicities did not choose their own ethnicity correct over all the ethnicities. This contradicted my research, because in my research I found that ethnicities would have a greater recognition of people of their same ethnicity. Even though there are a wide variety of participants in my project, to make the results more conclusive I feel I could take a wider diversity of ages and ethnicities. My hypothesis was supported in my results though, due to the correlations in age, gender, and ethnicities that were discovered.</p>	
Summary Statement This project is about distinguishing the gender of a person based on only their eyes in a picture.	
Help Received My mother showed me how to use MS excel functions to organize my data tables and graphs.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Devon S. Hubert	Project Number S0415
Project Title It's Stuck in My Head! The Effects of a Repetitive Tune on Memory	
Abstract Objectives/Goals The purpose of this project is to investigate whether or not facts are easier for children to remember if they are presented through a repetitive tune. It was hypothesized that if a group of children, grades 5-8, listened to a list of ten, randomly selected words, numbers and letters being sung along to a tune twice, then they would be able to remember more of the list than an identical group in which the list was spoken to the children twice. Methods/Materials This hypothesis was tested by dividing four grades, 5-8, each into two groups, and testing them separately. In one group from each grade, a list of ten randomly selected words, numbers, and letters was read twice to the children, and in the other group, the same list was sung to the children using the tune of #Six Little Ducks#. In both groups the children were asked to write all the words they could remember, and then the results were collected. Results The no tune group recalled an average of 36.7% more correct words than the tune group overall. Conclusions/Discussion These results express a contradiction to the previously stated hypothesis, and therefore, according to the experiment the hypothesis is incorrect. There was, however a 6% greater increase of correctly recalled words in the tune group between the fifth and eighth grades, than in the no tune group. A project that investigates the relationship between age and memory for music or text could be done, since there is a possibility that the memory of facts increases more with age than the memory of facts without a tune.	
Summary Statement This project will investigate whether or not facts are easier for children to remember if they are presented through a repetitive tune.	
Help Received Test subjects were 5th-8th grade students at the Monterey Bay Charter School. Step-father created a computer program to generate lists of random words (2nd through 5th grade vocabulary), numbers, and letters per Devon's guidelines.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Welby Huynh; Amrutha Sugetur	Project Number S0416
Project Title Seeing Is Believing?	
Abstract Objectives/Goals Can memories be warped and changed by suggestion? If so, to what extent does gender play one's susceptibility to suggestion? And finally, are eye witness testimonies trustworthy?	
Methods/Materials 1)Gain consent from subjects. 2)Show subjects video. 3)Pass out the narratives. 4)Subjects have 40 seconds to read over narrative. 5)Administer the test. Subject will have 3 minutes and 30 seconds to complete the test. 6)Collect the tests. 7)Tell the subjects they can't share any aspects of the experiment as it will taint the results. 8)Grade the tests based upon details. 9)Record scores.	
Results We found that across the board females had done better than males in all three treatments (false, control, and true). We tested 306 people ages 12-19. Females had done 1.6% better with no suggestion, 2.6% better when subjected to false suggestions, and 3.2% better when subjected to true suggestions.	
Conclusions/Discussion We confirmed our hypotheses, but we uncovered more questions. We hypothesized that memories can be warped and changed by suggestion, females are less susceptible to suggestion due to the female mind tending towards noticing and remember details, and eye witness testimonies are not as trustworthy. We proved that memories could be warped and that females were less susceptible to males. When we compared the true and control treatments for the females something strange happened. The false treatment did better than the females of the control treatment. We had expected for the false statement to affect the false subjects so that their scores will be lowest of the treatments. We came up with a hypothesis in order to explain this. Because the female's mind tends towards observing and remember details, they were able to see through our false suggestions, thus being able to salvage their scores. Looking individually at the questions being answered incorrectly, we could see that either genders were indeed being misled by the false suggestions, though as a whole their scores do not reflect this. The fact that some questions are	
Summary Statement We are out to disprove the old adage "seeing is believing."	
Help Received We received help from Dr. Bonnie Eckhart, a educational pyshologist- gave us advice.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jacob Joens-Poulton	Project Number S0417
Project Title Swinging Moods and Swinging Stock Markets	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to identify corresponding trends in stock market changes in the countries of Great Britain, Saudi Arabia, China and the United States, as a result of world events from 2008 through 2010.</p> <p>Methods/Materials Stock market reports from four countries, (United States, Great Britain, Saudi Arabia, China) were analyzed to determine the dates when the individual markets either increased or decreased by 3% over a ten day period from 2008-2010. After these dates were identified, headline news media was reviewed and major world events recorded. These events were then categorized by themes. Using technology, data was analyzed and comparative results were ascertained.</p> <p>Results China's Heng Seng market experienced the greatest number of increases and decreases over the three years studied. The markets of Saudi Arabia and Great Britain each experienced an equal number of upturns and downturns of 3% or greater. The United States experienced 18% more downturns in the stock market than upturns. The stock market of Saudi Arabia was found to be the least likely to follow the trends of the other three countries.</p> <p>Conclusions/Discussion I concluded that domestic and international political and economic events did indeed play a pivotal role in influencing stock markets. I also discovered that China's Hang Seng market proved to be the most volatile of the stock markets. Consumer confidence played only a minor role in influencing the overall performance of the stock market.</p>	
Summary Statement My project looks at the correlations between the major stock markets of the United States, Great Britain, Saudi Arabia, and China and how they are influenced by world events.	
Help Received My father helped me with the use of Excel in constructing the charts and graphs.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Soumya Kandukuri; Zoe Pennington; Lakshana Senthilkumar	Project Number S0418
Project Title Reading the Stroop Effect with the Cambridge Word Scramble Theory on the Anterior Cingulate Cortex	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to prove that the hindrance caused by the Cambridge Word Scramble integrated with the Stroop effect can be directly correlated to inefficiency while multitasking in the Anterior Cingulate Cortex.</p> <p>Methods/Materials In order to collect objective data, we used 64 high school freshmen whom we did not know. After receiving informed consent, we tested them with 10 positive control tests (congruence between name of the color and color of the word), 10 interference tests (incongruence between the name of the color and color of the word), 10 positive scramble control tests (congruence between name of the color and color of the word with the word scrambled), and 10 interference scramble tests (incongruence between the name of the color and color of the word with the word scrambled). During testing, we used: 3 pens, 3 pieces of paper, 3 stopwatches, and snacks. We instructed each volunteer: a) You will be given strips of paper containing a sequence of words printed in colored ink. b) The ink colors used are red, blue, green, brown, orange, black, and purple. c) The task is to call out the ink color of each word as quickly as possible without making a mistake. d) If you struggle to name a color, try until you answer accurately, and only then can you move on to the next word. Each participant took all four of the tests, while we timed how long it took them.</p> <p>Results The positive test took an average of 5.7 seconds complete, the interference test, 9.4 seconds, the positive scramble test, 6.8 seconds, and the interference scramble test, 9.2 seconds. The positive test took 3 percent of the subjects the longest to complete the interference test, 53 percent, the positive scramble test, 6 percent and the interference scramble test 38 percent.</p> <p>Conclusions/Discussion Overall, our experiment forced the brain to dismiss the habitual function of reading a word, and find the actual color of it, which was a different action than it was used to. Our subjects took a longer amount of time when deciphering the color of the word. Since the brain can still recognize the word quite easily with the Scramble effect, our data did not show a significant amount of difference in the time it took to read the scrambled words compared to the positive test. Based on a compilation of our results, we found that multitasking is generally inefficient, because subjects were unable to perform two basic, simultaneous tasks.</p>	
Summary Statement We examined the most basic form of multitasking by comparing two well-known cognitive exercises in a specific region of the brain.	
Help Received Our advisor, Mrs. Joanne Quan, allowed us to use her room to conduct testing, helped recruit our subjects, and distributed the consent forms.	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Jonah S. Kaye	Project Number S0419
Project Title Read All About It: Does Reading from a Printed Page vs. a Digital Screen Affect Reading Comprehension?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I love to curl up with a good book. These days, however, many people would rather curl up with their electronic reading devices. Since such devices are replacing books in many academic settings, I wondered if there was any difference in reading comprehension between reading from a book and reading from a digital screen. As the basic brain pathways for interpreting written language seem constant, my hypothesis was that there would be no difference in reading comprehension between reading from a printed page versus a digital screen.</p> <p>Methods/Materials I selected two short readings from ACT practice tests, both prose fiction of similar length and difficulty. One passage described a woman experiencing Mexican art, while the other passage described a football team's final game. Each passage had a corresponding test of 10 multiple-choice questions assessing the reader's comprehension. I recruited 66 high school students, 33 male and 33 female, ages 14-17. Each student first read one of the two passages from a printed page, and took the corresponding multiple-choice test without referring to the printed passage. Next, the same subject read the other passage on a computer screen, and took the corresponding multiple-choice test without referring to the computer screen passage. Subjects were randomly assigned to which passage they read first and, with no time limit, each reading was timed.</p> <p>Results On average, the subjects scored statistically the same on both the printed and digital tests. The printed test scores averaged 6.83 out of 10 correct answers, while the digital test scores averaged 6.85 out of 10 correct answers.</p> <p>Conclusions/Discussion The overall data proved my hypothesis, that reading comprehension stays constant, whether reading from the printed page or from the digital screen. Of course, more subjects would have made this data even more statistically reliable. A 0.9 difference in the average overall scores of the two tests may have affected the data's reliability; however, subjects did spend on average 18 seconds more reading the higher-scored passage. In any case, it appears that whether curling up with a book or an electronic reading device, a reader's comprehension will not be affected.</p>	
Summary Statement Does reading from a printed page versus a digital screen affect reading comprehension?	
Help Received My science teacher, Dr. Heather Mellows, allowed me to conduct my experiment in her classroom, and provided me with a set of laptop computers.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Nossin Khan; Sonali Voleti	Project Number S0420
Project Title Smell to Taste	
Abstract Objectives/Goals The objective of this experiment is to see if smell affects taste. Methods/Materials Informed consent was obtained from 24 people. The people were blindfolded and nose plugs were put on to them. They were fed 8 different substances for 8 different tastes (salty, sweet, bitter, sour, minty, herby, spicy, plain). Tastes were recorded. The nose plugs were then taken off but, they were still blindfolded. Then, the people were allowed to smell the eight substances before they had to taste them. Data was recorded again. Results The subjects did better in the test where they were allowed to smell the substance before tasting it. Ages 18-23 did the best on the experiment and ages 50+ and 0-5 got the lowest scores on the experiment. Females got better results because they have more taste buds than males. Conclusions/Discussion We concluded that smell does actually affect taste. This explains why we don't enjoy eating when we are sick because we don't smell the food therefore, we are not enticed by it.	
Summary Statement My partner and I experimented if smell affects taste and we found out it does affect the taste because after you eat 3 bites of your food you start to loose your taste but it is smell the allows us to still taste it .	
Help Received Honors biology teacher, Mrs. Jacks reviewed our project and helped with the graphs. Mom, Laxmi Voleti, helped with decorating the board and bought the supplies. Parents drove us around.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Brad King; Jace King; Chris Lees	Project Number S0421
Project Title The Correlation of Cranial Circumference with the Cognitive Aptitude of Homo sapiens sapiens	
Abstract Objectives/Goals The goal of this project is to delve into the potential association of cognitive aptitude, quantified in this study in the form of students' grade point average (GPA, with one's head size. Despite the fact that previous experiments have explored this subject, they did not strictly adhere to the scientific method and certainly did not utilize information that was readily available to them. We will take this experiment a step further by comparing body height and head circumference to GPA separately, as the well as ratio of the two in an attempt to discover a measurement that is most closely associated with GPA.	
Methods/Materials Ruler (12 inch, pen, level, tape measure, paper, flexible tape measure, students <ol style="list-style-type: none">1. Measure three centimeters above the location in the center between the eyebrows.2. Wrap the flexible tape measure around the head quite snugly.3. Measure two and a half centimeters above each ear and make certain that the tape measure represents a perfect circle.4. Measure height.5. Graph data and analyze results.	
Results In this experiment we measured, calculated, graphed, and analyzed data in an attempt to draw a correlation between head circumference, body height, and the ratio of said measurements with GPA. We discovered that if one wished to guess one's GPA from one other piece of information, the body height would be the most efficient to carry out this requirement. Although none of our results were conclusive, we disproved the hypothesis that body height, head circumference, and ratio between these two calculations have any correlation to GPA.	
Conclusions/Discussion From our experimentation we discovered that there is essentially no correlation between head size, body height, and the ratio between these two measurements to one's GPA, thus disproving previous research done on this subject.	
Summary Statement The goal of this experiment was to prove or disprove whether head size, body height, and the ratio between these two measurements have any apparent correlation with one's GPA, and if so, which calculation best represents said GPA.	
Help Received N/A	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Zachary A. Kukoff	Project Number S0422
Project Title TruantToday	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals For my project, I wanted to see whether increased parental awareness of a negative student behavior -- in this case, student truancy -- could affect, and stop, that behavior.</p> <p>Methods/Materials I built a website, TruantToday.com, that would quickly and easily send out text and email messages to parents when students were marked as truant by a school. I tested TruantToday with 12 chronically truant student (meaning they attended less than 50% of school days) for two years at Port Richmond High School. I compared truancy rates of my test group before and after using the program.</p> <p>Results My project was an unqualified success. 75% of students enrolled in the program improved their attendance to the point where they were no longer considered chronically-truant. Additionally, on average, 50% of students enrolled in the program came back the same day that their parents were notified of their absences. Finally, students enrolled in the program had, on average, a 15% GPA bump year-over-year.</p> <p>Conclusions/Discussion Reducing student truancy has many real-world benefits. Currently, schools in California receive funding based on Average Daily Attendance -- or how many students come to school each day. For every day that a student misses class, a school loses up to \$48. By bringing students back to the classroom, we can help bring funding back to school. Additionally, the Department of Justice found that areas with higher truancy have higher rates of gang-violence, teen-pregnancy, and drug usage. By lowering truancy, we can also help lower crime. Finally, when students come to class, they are less likely to drop out of school.</p>	
Summary Statement I built a website, TruantToday, to determine whether student truancy could be lowered by increasing parental awareness of that truancy.	
Help Received	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Amy Lee; Tommy Wooding	Project Number S0423
Project Title Is a Picture Worth a Thousand Words?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of these experiments is to see if illustrations help enhance a child's reading and/or listening comprehension, and if so which type of child (struggling reader, average reader, or advanced reader), as categorized by the teacher, will benefit the most from the illustrations.</p> <p>Methods/Materials For the reading comprehension we will give the child a passage without illustrations to read and then a short test. Next the child will read a passage with illustration and a short test to follow. We will test students in fourth, fifth, sixth, and seventh grade. For the listening comprehension we will test first through fifth graders. We will go to each class and read a short story with illustrations and give them a test, we will then read a story without illustration and give them a short test. We then analyze the results.</p> <p>Results Our hypothesis was supported. Illustrations do enhance a student's test scores. The differences in test scores in each grade and category of students were larger than the variance in test scores. The illustrations improved the struggling students' comprehension the most. The illustrations also improved the average students' comprehension, but not as greatly. Advanced students' comprehension was only improved modestly.</p> <p>Conclusions/Discussion Illustrations do enhance a student's reading and listening comprehension skills. We noticed that the younger students' scores are heavily affected by illustrations. A student's ability to visualize written material plays a large role in the student's success in school. The advanced students have developed the skill to visualize, which the struggling students have not.</p>	
Summary Statement This project investigates whether illustrations enhance reading and or listening comprehension to elementary and middle school students.	
Help Received Gateway Elementary School and James Monroe Middle School allowed us to test the students.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Melissa R. Long	Project Number S0424
Project Title Who Lies More, Boys or Girls?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment was to compare trends in both male and female teens, analyzing rate of lying, types of lies, deception in relationships, self-perception, and feelings about lies. My hypothesis was that male subjects: (1) would report a higher frequency of lies than female subjects, (2) would report lying more to close friends, girlfriends, and parents, while female respondents would report lying more to acquaintances, (3) would report lying more for personal gain, but that female participants would report lying more about feelings, opinions and preferences, and to avoid hurting people's feelings, and (4) would report feeling less guilty about lying than female subjects.</p> <p>Methods/Materials I created a self-report survey, covering the aforementioned categories. The 21 question survey included 8 questions strictly characterizing liars. I administered the survey to teen girls and boys, ages 13-18. Participants were anonymous. No personal identifiers (names, birth dates, social security numbers, etc.) were collected. Subjects were informed: (1) survey was voluntary, (2) they could stop at any time they chose to, (3) they did not have to answer every question, (4) survey was about lying, (5) there were no risks involved, (6) that the study would provide a deeper understanding of the lying habits of teens. Teenagers gave verbal assent to participate. Surveys were collected by project advisor and were locked in her office at all times.</p> <p>Results Out of the 77 subjects, 60.87% of the male teen subjects and 31.48% of the teen girls classified as liars. Although more boys reported lying 3-5+ times a day, a high percentage of girls reported lying 1-2 times a day (males, 34.78%; females, 64.81%; P=0.0052). Boys reported lying more to parents, girlfriends (P=0.0040), and acquaintances, but girls reported lying more to close friends (P=0.0140). Overall, teen girls and boys reported a higher frequency of lies to those they are close to, suggesting that the closer teens are to someone the more deceptive they are. Male respondents reported lying more about accomplishments and knowledge, feelings, opinions, and preferences and to control people, but female participants reported lying more to avoid trouble. The study provides a deeper understanding of the lying habits of teenagers. It reveals that teenagers reflect the lying behaviors of adults; they are not better or worse.</p>	
Summary Statement My experiment compares the lying habits of both male and female teens.	
Help Received Myung Sim, Biostatistician, helped me with statistical analysis.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jaclyn N. Lundberg	Project Number S0425
Project Title Finding the Region of the Brain Linked to Addiction	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment uses the Stroop test, a psychological test first performed by J. Ridley Stroop, which targets the frontal lobe of the human brain, specifically the anterior cingulate cortex. The anterior cingulate cortex functions as an intermediary between higher cognitive thinking and basic cognitive thinking.</p> <p>Methods/Materials The Stroop test was implemented on the control group, females 18-65 who rarely drank, and the experimental group, females 18-65 with a history of addiction. Each participant was asked to read off a set of words, which demanded a different set of responses to the same stimuli (Stroop, 1935). The reactions of the participants were timed and recorded.</p> <p>Results The data results concluded that there is a significantly slower average time of reactions of the experimental group, which validates the hypothesis that the anterior cingulate was affected in adults with a history of addiction. When applying the t-test, the t-test variable was 2.208 (equal variances assumed and not assumed) with an alpha level of 0.05 and a confidence level of 95 percent at 58 degrees of freedom, and the critical value for this 95 percent interval is 2.00, which concludes that the t-test variable rejects the hypothesis null.</p> <p>Conclusions/Discussion For further research, MRI studies could be used to analyze the anterior cingulate and its effects on addiction more in-depth. Also, recently researchers have experimented with pacemakers in the brain for mental illness patients. These techniques may be able to be applied to addicts to introduce new neurological pathways, and this is another option for possible further research. Other regions of the brain, such as the insula, another region of the frontal lobe should be analyzed to see which other regions in the brain play a key part in addiction.</p>	
Summary Statement Using the Stroop Test, which is a neurological test for the anterior cingulate of the brain, it was concluded that the anterior cingulate of addicts is neurologically different when compared to non-addicts.	
Help Received Help from House of Hope Addiction Center, San Pedro to provide subjects for experimental group	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Jessica Menera; Samea Sabrina Noreen	Project Number S0426
Project Title Psychosocial Development of Erickson's Stages: Casting in MTV's Teen Mom	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals According to People magazine over half a million teenage girls, who became pregnant in 2008, kept their babies. This study was created to examine the impact that being a teenage parent has on the teenager's social development based on Erik Erikson's Psychosocial Developmental Stages. It was predicted that in couples who keep their babies the fathers would stay in a stage of adolescence while the mothers would move to the early adulthood stage.</p> <p>Methods/Materials A study guide was created for Erickson's stages, focusing on adolescence (identity vs. role confusion) and early adulthood (intimacy vs. isolation). A coding sheet was developed to classify statements and behaviors that would be either, adolescent or early adulthood. Using a rating scale and the coding sheets behaviors and statements of each member the cast of MTV's Teen Mom were recorded to determine their placement as being in an adolescent or early adulthood stage of development. The couple in the show who had placed their child in an open adoption represented the control group.</p> <p>Results The study indicated that teenage mothers who keep their babies moved to early adult hood faster than their non-parenting counterparts and fathers show less movement into early adulthood when faced with parenthood than did the teenage dad that did not take on the responsibilities of parenthood.</p> <p>Conclusions/Discussion In order to determine if the trend from adolescence to early adulthood of the teen mom is due to keeping the baby, we would like to study teenagers who have not had the responsibility for raising a baby. Our question would be: do girls still move more quicker than their male counter parts to early adulthood. If not, then we could conclusively say that teen mothers progress more rapidly into early adulthood.</p>	
Summary Statement This study was created to examine the impact that being a teenage parent has on the teenager's social development based on Erik Erikson's Psychosocial Developmental Stages.	
Help Received Dr. Blizzard, School Principal helped to teach us how to create the coding sheet. Mr. Carlo, our English teacher helped proofread our report.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Danielle Nguyen; Michelle Xie	Project Number S0427
Project Title Sonification: A Novel Approach to Data Representation	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to determine the type of sound wave that is most differentiable to the human ear when layering multiple instances of that type of sound wave. Our hypothesis was that each variable would improve the differentiation accuracy of multiple sound streams; multiple-sine wave and sawtooth wave were expected to increase the accuracy the most.</p> <p>Methods/Materials A computer program was constructed using Jsyn, a Java API for audio synthesis. The program played trials for the control--a single sine wave--as well as for the experimental variables--amplitude, musical notes, multiple-sine wave, sawtooth wave, and location on the stereo panorama. Next, 66 subjects were asked to report the number of sound streams they could distinguish for each of the 24 trials for a total sample size (N) of 1584. The best differentiated type of sound wave was determined through statistical significance tests.</p> <p>Results Through multiple chi-squared and t-tests, the sawtooth sound type was found to be the most differentiable variable ($p=.0000$). The statistical tests also indicated that the multiple-sine wave had significantly greater differentiation rates than the control ($p=.0030$). The correlation drawn between musical background and the inaccuracy in distinguishing the correct number of sound streams indicated a very weak, negative relationship ($R^2=.0986$). An additional chi-squared test demonstrated that there was a significant difference in inaccuracy between males and females.</p> <p>Conclusions/Discussion The hypothesis was validated: the data indicates that increased complexity in timbre facilitates the differentiation of multiple streams of sound; in other words, subjects more accurately report the number of sound streams when the sound quality is richer.</p>	
Summary Statement The project focuses on the psychoacoustics branch of sonification, specifically, the differentiation of multiple data streams.	
Help Received Joachim Gossman introduced us to Jsyn and sonification.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Sharona A. Silverstein	Project Number S0428
Project Title Sleep Patterns and Psychological Health in Pre-Dental and Dental Students	
Abstract Objectives/Goals This study examines the association of sleep patterns with psychological health in pre-dental and dental students. It is hypothesized that short sleep duration, high sleep debt, and later bedtime will be associated with poorer psychological health as shown by higher scores on negative moods and lower scores on positive moods. Methods/Materials 137 pre-dental and dental students were surveyed for sleep patterns, negative moods (negative affect, hostility, sadness, fatigue, stress), and positive moods (positive affect, joviality, attentiveness, life satisfaction, optimism, happiness, empathy). Results Average sleep duration was 6.7 hours on school nights and 8.2 hours on weekends ($t = -13.63, p < .0001$); 57.6% reported napping. Average sleep debt ($= [\text{hrs slept on weekends} - \text{hrs slept on school nights}] \times 5$) was 5.5 hrs/wk. Short sleep duration, higher sleep debt and later bedtime were each associated with significantly higher scores on negative moods and lower scores on positive moods, with sleep debt having the strongest associations (range $r^2 = .02 - .23, p = .05 - < .0001$). ANOVAs showed students who slept 6 hours or less, had >7 hours sleep debt/week, or went to bed at 2 am or later had significantly higher scores on most negative moods and lower scores on most positive moods. There were no differences between early birds and night owls on mood. Conclusions/Discussion Sleep patterns resulting in a deficit of sleep (short duration, high debt, or late bedtime) are associated with poorer psychological health as evidenced by a variety of moods. Students with 6 or fewer hours of sleep per night, >7 hours of sleep debt/week, or bedtime at 2 am or later may be particularly vulnerable. Dental schools and pre-dental programs at undergraduate colleges should counsel students about the importance of sufficient sleep.	
Summary Statement This project examines the association of sleep patterns (sleep duration, sleep debt, and bedtime) with psychological health as shown by moods in pre-dental and dental students.	
Help Received Parents gave helpful comments and paid for the supplies used; Father allowed me access to pre-dental students; Student Directors of the Pre-Dental Society and two former pre-dental students now in dental school helped distribute my surveys.	



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Michelle C. Stanley	Project Number S0429
Project Title A Statistical Analysis of Kern County Bankruptcy and Divorce Filings in Different Economies	
Abstract Objectives/Goals The objective of this analysis was to determine if bankruptcy and divorce filings in Kern County follow national trends which indicate there are fluctuations in the number of filings in good as opposed to poor economies. Methods/Materials Economic trends over the past ten years in Kern County were examined. 2004 was determined to be a "good" economy, and 2008 was determined to be a "poor" one. Chapter 7 bankruptcy filings were obtained from the Eastern District of CA, and divorce filings were obtained from the Kern County Superior Court...a long and tedious process. Couples who filed for divorce were entered back into the bankruptcy court website. This process determined the number of couples who filed for both divorce and bankruptcy. Results In 2004, there were 2,816 chapter 7 bankruptcy filings. There were 2,482 divorce filings. 291 couple filed both. In 2008, there were 2,903 chapter 7 bankruptcy filings. There were 2,296 divorce filings. 453 couples filed both. Conclusions/Discussion The numbers in the study support the hypothesis and national historical trends. In a good economy, bankruptcy rates fall and divorce rates rise. In a poor economy, bankruptcy rates rise and divorce rates fall. An interesting finding is in the numbers that file for both divorce and bankruptcy. Between 2004 and 2008, there was a 64% increase. According to local family law attorneys and bankruptcy attorneys surveyed for this project, most agree bankruptcy doesn't save marriages by eliminating debt. Discharging debt makes the divorce process less complicated.	
Summary Statement This project combines research, analysis of data, and mathematics to identify correlations in the subject.	
Help Received My dad was instrumental in teaching me how to obtain court documents.	



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Rebecca C. Stark	Project Number S0430
Project Title Internet Adoption Among People Over 65	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of my project was to research factors behind Internet adoption among people over 65 and discover why some seniors have adopted the Internet while others haven't. As the senior population in our country continues to grow each year, this issue is becoming increasingly pressing. Internet can help seniors improve their quality of life, and I believe that identifying the driving motives behind adoption of the Internet can increase Internet usage.</p> <p>Methods/Materials After speaking with various seniors as well as with a professor from the Stanford Center for Longevity, I created a survey that asked seniors about family, use of technology (specifically the Internet), and previous job experience. I created a final draft of the survey and delivered 200 copies to various senior homes in my community. I then collected completed surveys, tabulated the responses into Survey Monkey and analyzed the results.</p> <p>Results I learned that the majority of seniors who are active Internet users learned to use the Internet out of necessity. By this, I mean that they either had to use the Internet in a job they held prior to retiring (in order to be successful) or they use the Internet to stay in touch with far-away family members. Non-Internet users typically did not have work experience involving the use of the Internet and their family members tended to live close by. However, this only partially explained the use of the Internet. Many active Internet users are internally motivated to use the Internet. They taught themselves, and they felt more confident about their skills than non-users.</p> <p>Conclusions/Discussion In order to increase Internet usage among seniors, we need to boost motivation and confidence. Motivation stems from showing seniors the value of the Internet. We need to help seniors understand how and why the Internet can improve their lives. Confidence stems from a belief that they can successfully learn a new technology. Educators can help by simplifying methods for teaching seniors. In doing both these things, we will be able to harness the power of internal forces in helping seniors use the Internet. We also need to help family members by providing them with effective tools for working with their seniors. That way, we can also use a grass-roots approach. In my science project next year, I hope to build on this project by evaluating teaching methods to help senior citizens use the Internet.</p>	
Summary Statement I worked on understanding why some seniors adopt the Internet while others do not.	
Help Received My mother helped by delivering and picking up surveys to/from senior centers.	