



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Nickolas H. Abbott	Project Number J0701
Project Title How Powerful Is Suggestion?	
Objectives/Goals How does suggestive imagery affect food choices? I believe that suggestive imagery, when presented to a person can cause them to chose a specific food.	
Abstract The test was in a conference room 10'x16'. Test subject thought they were there for a test. I tested 8 people per candy bar flavor. Control person was already seated at the table when test subject arrived, seated across from the test subject. In front of the control subject a candy bar was placed; a Hershey's, a MilkyWay Bar & Snickers bar. Once they finished answering the questions they were thanked and asked on their way out if they would like a candy bar as a thank you. I counted the bars after they left and added that to my results. Private closed room test area, Digital Camera. Release Form. Test Subjects. Control Subject. Candy bars; Computer, Paper Tests, 2 Desks, Chairs, Pencils.	
Methods/Materials The test was in a conference room 10'x16'. Test subject thought they were there for a test. I tested 8 people per candy bar flavor. Control person was already seated at the table when test subject arrived, seated across from the test subject. In front of the control subject a candy bar was placed; a Hershey's, a MilkyWay Bar & Snickers bar. Once they finished answering the questions they were thanked and asked on their way out if they would like a candy bar as a thank you. I counted the bars after they left and added that to my results. Private closed room test area, Digital Camera. Release Form. Test Subjects. Control Subject. Candy bars; Computer, Paper Tests, 2 Desks, Chairs, Pencils.	
Results Each group consisted of 8 test subjects. In the first test group # 1 I had the control person displaying and eating the Snickers Bar. Out of the 8 people 6 of them chose the Snickers as they left the test room, 1 chose the Milky Way Bar and 1 chose not to have a candy bar. Out of the 8 people 5 of them told me after the test that Hershey's Chocolate bar was their favorite, 2 said Snicker's was their favorite and one said Milky Way was their favorite. In the second test group #2 I had the control person displaying and eating the Milky Way Bar. Out of the 8 people 4 of them chose the Snickers as they left the test room, 3 chose the Milky Way Bar and 1 chose the Hershey's bar. Out of the 8, 3 told me after the test that they liked Snicker's candy bars as their favorite, 3 liked Hershey's and 1 said Toblorone , and 1 likes Reese's Peanut Butter Cups as their favorite. In the third and final test group #3 I had the control person displaying and eating the Hershey's Bar. Of the 8 people who took this test, 1 chose the Snickers as they left the test room, 0 chose Milky Way Bar and 7 chose Hershey's bars. Out of this group, 3 said Snicker's was their favorite 4 said Hershey's was their favorite 1 said Hershey's with almonds was their favorite.	
Conclusions/Discussion Conclusion is that there is a correlation between the control candy bar and the candy bars chosen. One thing I would change if I did this test again is I would use different food items. I would use three different food items so that there may not be a favorite.	
Summary Statement The Power of Indirect Non-Verbal Suggestion	
Help Received no	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Zafir W. Abou-Zamzam	Project Number J0702
Project Title The Effect of Age and External Stimuli on Reaction Latency	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Distractions have caused many car crashes because people cannot react fast enough when distracted. The objective of this study is to determine if age and distractions affect reaction times.</p> <p>Methods/Materials I wrote a computer program in C++ to determine reaction time. The program was designed to measure the length of time it takes for a person to touch a key after the computer screen turns yellow. The screen would go through one to four random color changes at random time intervals before it turned yellow so the color change could not be anticipated. A total of 60 people divided equally into three age groups were tested: under 20 (young), 20-39 (middle), and over 39 years (old). Each subject was tested ten times with no distraction to determine baseline reaction time, then ten times while talking on a cell phone when asked open-ended questions according to a written script, and ten times while listening to loud music. After all data were recorded, statistical analyses were performed.</p> <p>Results At baseline, the young group had an average reaction time of 0.40996 seconds, the middle group had an average reaction time of 0.41501 seconds, and the old group had an average reaction time of 0.479445 seconds ($p=0.03$). The cell phone conversation lengthened reaction times by 44.7% in the young group ($p=0.008$), 25.6% in the middle group ($p=0.002$), and 24.3% in the old group ($p=0.0005$). Listening to music shortened reaction times by 2.7% in the young group ($p=0.5$), 2.4% in the middle group ($p=0.3$), and 5.7% in the old group ($p=0.1$); however, these results were not statistically significant.</p> <p>Conclusions/Discussion People should not talk on their cell phones while participating in activities requiring fast responses, but listening to music is acceptable. Because older people have slower reaction times than younger people, older people may be less capable when they need to complete tasks requiring quicker reactions.</p>	
Summary Statement I wrote a computer program to determine reaction time and measured the effects of age and distractions on reaction times.	
Help Received Cell phone conversation speaking: Safia Abou-Zamzam; recording data: Aida Abou-Zamzam, Ahmed Abou-Zamzam, Sharon Lum; debugging program advice: Albin Gasiewski; statistical software advice: Sharon Lum	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Ryan R. Allen	Project Number J0703
Project Title Steer, Don't Veer	
Abstract Objectives/Goals My objective was to determine if human beings tend to walk in a circle while blindfolded and, if so, whether certain factors (such as gender, age and right- or left-handedness) tend to affect the walking patterns of blindfolded people. Methods/Materials I set up a 20-meter walking course on a flat sidewalk, which I marked with a straight chalk line. I blindfolded each of 20 volunteers and asked them to walk in a straight line for 60 seconds. I measured the distance each volunteer walked and the distance he or she deviated from the straight line. I then covered the straight line with a dark tarp and asked each person to walk in a straight line without the blindfold for 60 seconds. I recorded each volunteer's age, gender and right- or left-handedness. I conducted three separate days of 40 trials, each a week apart. Results The blindfolded volunteers veered from the straight line by an average of about 3.5 meters over the three trials. The same non-blindfolded volunteers deviated by an average of 0.86 meter from the chalk line. Most of the subjects strayed more from the straight line the farther they walked. Conclusions/Discussion My results did not directly show that blindfolded people tend to walk in a circle. However, I believe the results suggest that if I had allowed the volunteers to walk for a longer distance, they would have walked in a circle. After only 60 seconds of walking blindfolded, volunteers deviated from the straight line by an average of more than 15% of the total distance they walked. A person's gender or right- or left-handedness did not seem to affect his or her ability to walk in a straight line, but older age did seem to help a person to walk straight. Practice did not seem to help volunteers to walk straight while blindfolded.	
Summary Statement Will people tend to walk in a circle while blindfolded?	
Help Received My father helped to design the walking course and to measure the distance that volunteers strayed from the straight line. My mother provided the bandana used to blindfold the volunteers and placed the bandana over the eyes of each volunteer. She also helped me to recruit volunteers for the study.	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Noorhan Z. Amani	Project Number J0704
Project Title Ready, Get Set, Move, and Learn	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of my project is to see if students test scores could be improved by incorporating lessons from core subjects such as math and language arts in Physical Exercise (PE). This will make learning interesting and at the same time enable schools to improve their standardized test score without reducing the PE class time.</p> <p>Methods/Materials Informed consent was gathered from 39 third and fifth grade students. Using Parks Le Tellier Modality Indicator survey, students were categorized as visual, kinesthetic or auditory learners. Then students were randomly divided into the experiment group and control group. Both groups were first taught a math lesson in class and their learning was captured with a standard test. In their next Physical Exercise (PE) class, the experiment group practiced some concepts from the same math lesson in their PE. The control group did regular PE and received a usual classroom review of the lesson. After PE, both groups took again a standard test to assess their learning. The same procedure was repeated for language arts.</p> <p>Results After PE the improvement in the average math score for experiment group (those who participated in lesson incorporated PE) is 23%, while for the control group it is 10%. In language arts the improvement in test score for the experiment group is 24% and for the control group it is 3%. All three types of learners (visual, kinesthetic, and auditory) in the experiment group did significantly better in the tests after participating in a core lesson incorporated PE.</p> <p>Conclusions/Discussion The results agreed with the hypothesis. Students in experiment group who participated in core lesson (from math and language arts) incorporated PE did significantly better in tests than students in control group who did regular PE. This proves thoughtfully combining classroom lessons in PE can help students to be healthy and excel in their academics at the same time. As all three kinds of learners (visual, kinesthetic, auditory) benefited from core lesson incorporated PE, this approach can be helpful for all kinds of learners in a class.</p>	
Summary Statement Incorporating lessons from core subjects such as math and language arts in physical exercise can help students to improve their test score.	
Help Received Science teacher helped with procedure; Parents helped with presentation board	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) AnneMarie An; Zoe An	Project Number J0705
Project Title Nursery Rhyme Mania 3: Does the Use of a 22° Slant Board & Blocking Methods Improve Reading Fluency in 7-14yro Students?	
Objectives/Goals The objective is to determine if the use of a Slant Board and Blocking Methods improve reading fluency in students.	
Abstract Methods/Materials Informed consent was obtained from a voluntary sample of 210 students in libraries, 79 girls and 83 boys, aged 7 - 14. We recorded 82 readers using Full Blocking (FB), Partial Blocking (PB), & Eyes Only (EO) on a Slant Board (SB) and 80 readers using FB, PB, & EO on a Flat Table (FT). The rhymes were rotated through the blocking methods. Each reader read one practice & three test rhymes. We timed the rhymes to within one second of each other, recorded the mean, counted the errors agreed on outcome 100%, and then averaged the data to determine if reading angle & method improved fluency. Speed & accuracy was analyzed by age & gender.	
Results The first part of our hypothesis was supported; readers read faster & made fewer errors on a SB than on a FT. The second part of our hypothesis was refuted. Readers using FB read slower, but made fewer errors than EO. Readers using PB read slower & made more errors than EO. After filling in our tables & graphs, we found an uncontrolled variable (age) in our experiment. We re-separated the data by age, but each age group did not contain all three rhyme sequences. To learn how reliable the results were, we ran a second test using one age & gender. The results from the first & second set of trials were almost identical.	
Conclusions/Discussion Nationally, 4 out of 10 children cannot read at a basic level. A systematic reading program can improve reading. Our SB may have improved fluency because it keeps the text at the same perspective. We think schools should consider replacing worn-out desks with slanted work surfaces. FB may have been refuted because we used a unique font (FB was read 1st & EO 4th) and unique fonts take practice for readers to improve their speed. Or, FB may have been slower because the reader had to refocus with each card movement. FB research should be continued to rule out the weaknesses in our experiment.	
Summary Statement The purpose of our experiments is to determine if the use of a slant board & blocking methods improve reading fluency in students.	
Help Received Mr. Williams sent an important article; Dad downloaded recordings; Mom helped with the internet & Exacto blade (FB card); & 210 students participated.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Rachel R. Andrecht	Project Number J0706
Project Title In the Eye of an Artist	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My objective was to determine at what age a child can draw the human body with the fullest amount of body parts.</p> <p>Methods/Materials In this project I tested 45 subjects. There were fifteen children in each age group, five, six, and seven year olds. I tested five children in the same age group at a time. I then gave them a piece of paper and a pencil. I explain to them that they will be drawing a picture of themself. They had 5 minutes to complete their picture. When the 5 minutes were up I told them to stop, and to put their initials and age on the paper.</p> <p>Results I did observe that the 5 year olds took the least amount of time to complete the drawing. All 45 of my subjects completed their picture within the 5 minute period. The body parts that were tested to be drawn were 2 eyes, 1 neck, 5 fingers, 1 mouth, 1 torso, 2 legs, 1 nose, and 2 arms. Overall, my 7 year olds drew 5 body parts of the 8 tested 100% of the time. As my data shows, the 7 year old will represent the human body with the fullest amount of body parts most consistently.</p> <p>Conclusions/Discussion In conclusion, the data did not support my hypothesis. I originally thought that at 6 years old a child would be able to draw the human body with the fullest amount of body parts. My test results show that a 7 year old begins to draw the human body with the fullest amount of body parts present. This project could be done in a number of ways. Asking the children questions about their drawings or asking them to draw two people and explain the differences and similarities in both. Realizing a child's fears or anxieties might also show through their art. More importantly, how they might feel about themself. Through their art we see more than just a figure from a child, rather the visual perception of a growing mind.</p>	
Summary Statement At what age does a child begin to draw the human body with the fullest amount of body parts.	
Help Received My mom helped proofread report; My dad helped with printing process; Students of St. Mary's School for their participation.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Kyle Beedle; Henry Pfaff	Project Number J0707
Project Title Ring! Ring! Phones and Reaction Time	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to identify any difference in reaction time while talking on the phone hands-on and hands-free.</p> <p>Methods/Materials We received consent from 15 people (ten 8th grade students and five adults) to test their reaction times. To test reaction time, we had the test subjects catch a meter-stick when we dropped it between his/her fingers. We measured the reaction time by the distance, in centimeters, the meter stick dropped before being caught. We first measured the subjects' reaction time with no distractions (control). For the hands-on test, we then repeated this while the test subject was answering the questions one of us was asking them over the phone. For the hands-free test, we repeated the reaction test while playing on speaker phone a recording of twenty questions that we had made on the cell phone earlier.</p> <p>Results Overall combined average reaction time was fastest for the controls, hands-on was next fastest, and hands-free was slowest. For the eighth grade, we found that the control was much better reaction time than the other tests, but, unexpectedly, the hands-free was slightly worse than the hands-on. For the adults, we found that not only was the hands-on much better than the hands-free but it was even about the same as the control. Finally, we found that the adults overall had superior reaction times to the eighth graders.</p> <p>Conclusions/Discussion From our results, we found that talking on the cell phone hands-free effects people's reaction time even more than hands-on. In either case, reaction time was worse than control, so we think talking on the cell phone either way is unsafe while driving.</p>	
Summary Statement Our project is about how reaction time is affected by talking on the phone both hands-free and hands-on.	
Help Received Mother helped type report	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Rahul Bekal	Project Number J0708
Project Title Ebbinghaus Illusion: Left to Right or Right to Left?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to find out if the brain perceives from left or right or right to left, while reading. Specifically the project tests if the Ebbinghaus illusion is more when the comparison circle is to the right of the test circle or not. My hypothesis, based on my research is that the brain perceives from left to right and therefore the Ebbinghaus illusion will be more than if the comparison circle is to the right of the test circle.</p> <p>Methods/Materials For my procedure I made a test on PowerPoint which tested the Ebbinghaus Illusion. The test compared the overestimated and underestimated Ebbinghaus illusion stimuli to the test circle. The test had the stimuli and the test circles were compared from left to right and right to left.</p> <p>Results Control testing was done where the test circle of 8.88 mm was on the left with no illusion and the comparison circles were on the right. Most of the chosen answers (85 %) were within +0.25 and -0.25 showing that there was no illusion and therefore the testing was done right. Control testing was also done for the right side where the test circle with no illusion was on the right and the comparison circles were on the left. 88 % were within the +0.25 and -0.25 range, once again showing that there was no illusion therefore the testing was done right. 32% of the volunteers overestimated the size, 31% underestimated and 37% chose the right size in the Overestimated Ebbinghaus Illusion Left configuration. 70% of the volunteers overestimated the size. 7% underestimated the size and 23% chose the right size in the Overestimated Ebbinghaus Illusion right configuration. 76% of the volunteers underestimated the size of the central circle 13% overestimated the size and 11% chose the right size in the Underestimated Ebbinghaus Illusion Left configuration. 86% of the volunteers underestimated the size.</p> <p>Conclusions/Discussion For the overestimated Ebbinghaus illusion configuration more number of people perceived the illusion when the circles were compared from right to left (70%), and less number of people perceived when the circles were compared from left to right (32%). Similar results were seen in the underestimated Ebbinghaus illusion configuration. When compared from right to right to left 86% perceived the illusion and when compared from left to right 76% perceived the illusion.</p>	
Summary Statement Testing to discover direction of brain perception using Ebbinghaus Illusion.	
Help Received	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Katherine L. Chase	Project Number J0709
Project Title Does Vision Influence the Other Senses?	
Abstract Objectives/Goals The purpose of my project was to determine if vision influences the other senses. Methods/Materials The materials I used for this project were: limes and a blindfold Results The results showed that vision did influence the other senses, supporting my hypothesis. Conclusions/Discussion As stated in my hypothesis, I believed that vision would influence the other senses. The experimental data supported my hypothesis indicating that it should be accepted. I believe the reason for this is that when you cannot see what you are about to taste or smell, the flavor or aroma will be shocking and unexpected.	
Summary Statement My project was about the influence vision has on the other senses.	
Help Received Mother helped type report, Teacher helped edit report, Step-dad helped with display board	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Sarah N. Chay	Project Number J0710
Project Title Lying Is Hard Work!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my experiment was to answer the question: can you predict whether a person is lying or not, based on how fast she answers 10 questions while performing a simple physical task? I hypothesized that if a person is lying, her brain would have to work harder, and therefore she would take longer to answer all the questions than if she were telling the truth.</p> <p>Methods/Materials To perform this experiment, I enlisted 20 volunteers (all 12-13 year old girls) as test subjects. The volunteers were divided into two groups of 10 subjects each. One group was assigned to be the lying group, while the other was assigned as the truth-telling group. A questionnaire was developed consisting of 10 simple questions. Each test subject was instructed to stack (and re-stack) 10 plastic cups while answering the 10 questions in the questionnaire. Subjects were timed from the moment the first question was asked until the last question was answered. Each test subject was randomly assigned a unique identifier. Subjects in the truth-telling group were assigned A-1 to J-1, while subjects in the lying group were assigned A-2 to J-2. Subjects with the same identifying letter were paired together to compare their measured times (for example, A-1 with A-2, etc.)</p> <p>Results Nine of the ten subjects (90 percent) of the lying group took a longer timer to answer the questionnaire while stacking cups. Only one subject (10 percent) from the lying group answered the questions faster than her paired subject from the truth-telling group. As a group, the subjects who lied took an average of 5.28 seconds longer to answer the questions than the subjects in the truth-telling group.</p> <p>Conclusions/Discussion The data showed that, except for one pair of subjects, members of the lying group took an average of about five seconds longer to answer all the questions than members of the truth-telling group. I concluded that this supported my hypothesis, and therefore I attained my objective for the experiment. The information from this experiment will help us better understand the brain and how it works. It may help find different uses for fMRI scans, which may lead to a new and improved system of lie detection tests. It could also be a step to the development of a new lie detector in the future.</p>	
Summary Statement When a person is lying, her brain has to work harder than when telling the truth, thereby slowing down her response time.	
Help Received Dad helped edit for grammar and spelling. Mom helped with board ideas and experimentation.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Emerson K. Coman	Project Number J0711
Project Title The Effects of Doodling on Student Recall	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I have always doodled in class. I came across an article about a test involving adults, half of whom were told to doodle while listening to a telephone conversation. Later, when they were tested on their factual memory of the conversation, it was found that adults who doodled remembered 29% more than those who did not doodle. I decided to test the effects of doodling on elementary and middle school student recall. After some researching, my hypothesis was that students who doodled during a memory test would better recall information than students who did not doodle.</p> <p>Methods/Materials For this experiment, I tested eight classes of students in grades 4 - 7. Each class was tested twice. During one test students were told to doodle on provided paper while listening to a factual article about a type of insect. For a second test, while listening to a similar article about a different insect, they were instructed not to doodle. I randomized the test order. In each case, when the article was finished the students waited 20 seconds, then were tested on their memory of facts from the article.</p> <p>Results Approximately 136 students were tested. My results showed that subjects who did not doodle while listening to a test article recalled 11% more on average than those who did doodle. In fact, every class had significantly lower scores when they doodled. The findings showed that doodling has a significant adverse effect on student memory.</p> <p>Conclusions/Discussion Due to my findings, I recommend that students maintain eye contact with teachers during class lectures for optimal information retention. In this experiment, the information I gathered did not support my hypothesis, which was that those who doodled would have greater recall of information. In the future I might test the effects of doodling on long-term memory. This experiment only tested short-term memory.</p>	
Summary Statement My project explores the effects of doodling in class on student recall.	
Help Received parents helped edit report; science teacher's guidance; participants in experiment	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Chau Dang	Project Number J0712
Project Title Optical Flare	
Abstract Objectives/Goals This project is based on genders, boys and girls. The main idea of this project is understanding more about how body works and the difference between girls and boys in learning. I will get to learn which gender has between visual memory and how eyes and brain work together. The background of this project will base on the information I get from the Internet. After that, I will state my hypothesis and start doing my testing experience. From this project, I will learn how to create my own materials which is the two changed-picture (GIF) for the testing. My goal is to learn more about girls and boys and their ways to learn subject.	
Methods/Materials 1. Internet Connection 2. Computer 3. PhotoScape software 3.5 4. Two pictures with one difference from Google 5. Two black pictures 6. Timer 7. Notebook 8. 100 students volunteer; 50 girls and 50 boys 9. Testing areas	
Results In this experience, I was trying to find the average of which gender has better visual memory. My independent variable was genders. My dependent variable was the number of the student that could find the difference in 45 seconds. I compared the number of the male and female students that were and were not able to recognize the difference between the two pictures over a period of 45 seconds. Out of 50 males tested, 10 of them recognized the difference, and 40 did not. Out of 50 females tested, 15 recognized the difference while 35 did not. In total, out of 100 students I tested on, only 25 of them could find the difference.	
Conclusions/Discussion After I finished the testing experience for my science fair project, I've learned that girls have better visual memory than boys. Also, most of the student didn't find the difference between the pictures in 45 seconds. This also stated my hypothesis was right from the start. Boys are more likely to handle a physical object, while girls are more likely to use visual exploration.	
Summary Statement Girls have better visual memory than boys because they are more likely to use visual exploration, looking carefully at a novel object without actually touching it while boys are more likely to handle a new physically object.	
Help Received Teachers helped answer the questions; Parents helped buying materials for the board; Friends gave support and volunteered for the testing experiment.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) William H. deBruyn Kops	Project Number J0713
Project Title The Correlation between Brain Dominance and the Introvert/Extrovert Personality Trait	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This project was to determine if there is a correlation between the dominance of one side of the brain, and the trait of having an extroverted or introverted personality. It was hypothesized that if a person's right side of their brain is dominant, then she/he will be more likely to be an extrovert than a person whose left side of his brain is dominant.</p> <p>Methods/Materials 415 students were given a test to figure out if they were an introvert or an extrovert, and if they were left-brain dominant or right-brain dominant. I then figured out if there was a correlation between these traits.</p> <p>Results I found that 94% of right-brain dominant people were extroverts, whereas 75% of left-brain dominant people were extroverts.</p> <p>Conclusions/Discussion Therefore, the hypothesis was proven correct, and right-brain dominant people are more often extroverts than left-brain dominant people.</p>	
Summary Statement The main goal of this project was to find a correlation between the dominance of one side of the brain, and the trait of having an extroverted or introverted personality.	
Help Received Mother helped teach me how to make board look attractive.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Nathan R. Fennacy	Project Number J0714
Project Title Let's Test the Test!	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project is to determine if a testing style, in this case verbal versus written, shows a better result in scores for math, spelling, history, and/or science.</p> <p>Methods/Materials The materials needed for this project included developing appropriate 7th-grade level questions to create an exam. Copies of the exam were then reproduced in order to supply tests to each participant, who also had to have signed permission from his/her parent to be a part of this study. Twenty-six 7th grade students were given five-question mini-quizzes on math, spelling, history, and science. The test questions remained the same, but students were given the test in both a verbal and written format. The verbal exam was read and answered on supplied sheets of paper. The written exam was then given after that.</p> <p>Results For math and spelling, students performed best on the written exam. A third factor came into play when interpreting data where students scored the same on both exams. For the science and history section, more students scored identical on both formats of tests. When combining all subjects, overall scores showed students did best on the written exam.</p> <p>Conclusions/Discussion This project concludes that a written test shows better results for 7th graders at a certain school. I can tell teachers my results so that they can use the written test format in order to allow students to perform their best on tests. If I were to continue with this project, I would test more grade levels and different schools. I would also try and test a bigger populous of students to get more accurate results.</p>	
Summary Statement I explored the difference between verbal and written test formats to see which format showed better results for seventh-grade students.	
Help Received Science teachers Gina Burdine and Kendia Herrington were mentors on this project. My mom helped edit my board and research paper. And my dad helped me with the sticky spray to get all the items on the board.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Hondo G. Gonzalez	Project Number J0715
Project Title Will Positive Subliminal Messages Placed in the Instruction of Learning Improve Test Scores?	
Abstract Objectives/Goals The objective to my project is to determine if students exposed to positive subliminal messages in their instruction will show a higher growth in scores on timed multiplication tests. These students will be compared to a control group which will receive the same instruction without subliminal messages. Another group of students will be exposed to negative subliminal messages in their instruction to determine if this group has a lower growth in test scores than the control group. Methods/Materials Groups of students will be exposed to instruction using a School House Rock multiplication video segment from a DVD and then given a timed multiplication test. One group of students will view the video segment with positive subliminal messages imbedded into the video, a second group will view the video segment with negative subliminal messages imbedded into the video and a third group will view the video segment with no subliminal messages in the video. All groups will be measured on their growth to a baseline test. The baseline test will be a timed multiplication test prior to any video. My sample group consists of over 260 eighth grade students. Results When all growth measurements were averaged for the control group, they had a growth of answering 4.4 more questions correctly. Students that were exposed to positive subliminal messages had a growth of answering 6.7 more questions correctly. Students in this positive group were answering 2.3 more questions correctly than the control group. Students that were exposed to negative subliminal messages had a decrease in growth when compared to the control group. This negative group was answering 1.7 more questions correctly when compared to their baseline. If the 1.7 growth is compared to the control group's growth of 4.4 there is a decrease of 2.7 questions answered correctly. Conclusions/Discussion Positive subliminal messages shown in instruction resulted in a higher growth in test scores when compared to the control group. The data also showed that negative subliminal messages in instruction had a lower growth in test scores when compared to the control group. The growth for all test subjects was measured by comparing their baseline test score to each of the test scores they had for test 1 through test 5.	
Summary Statement My project tested to see if positive and negative subliminal messages placed in student instruction affected student test scores.	
Help Received Both of my parents helped me conduct this experiment by offering their classrooms and allowing students to volunteer to participate from each of their classes.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Courtney R. Heath	Project Number J0716
Project Title Focus: Effects of Distracted Driving	
Objectives/Goals To determine if distractions do affect a person's ability to operate a motor vehicle.	
Abstract Methods/Materials Portable table, Television, Forza Motorsports 4, Xbox, Steering Wheel, Flash Cards, Cellular phone , Questionnaire.	
TESTING 1.Read flash card #1. 2.Have the driver complete the questionnaire. 3.Read flash card #2. 4.Start test #1. 5.Observe the television for crashes, the vehicle going off road, speed, and how the driver operates the vehicle. 6.When the driver completes a lap, record the displayed time. 7.Repeat step #4 thru #6 two more times. 8.Read flash card #3. 9.Instruct the driver to hold a cell phone to their ear while driving and answering the questions. 10.Start test #2. 11.Ask the driver questions from the orange flash cards for each appropriate trial. 12.Observe the television for crashes, the vehicle going off road, speed, and how the driver operates the vehicle. 13.When the driver completes a lap, record the displayed time. 14.Repeat step #10 # step #13 two more times, using the appropriate orange flash cards. 15.Read flash card # 4. 16.Start test #3. 17.Using the blue flash cards, show the driver a series of questions while they drive. 18.Observe the television for crashes, the vehicle going off road, speed, and how the driver operates the vehicle. 19.Observe the driver for how they accomplish the required tasks and when they looked away from the screen. 20.When the driver completes a lap, record the displayed time. 21.Repeat step #16 # step #20 two times, using the yellow and green flash cards, as well as the appropriate props.	
Results Analyzing the data showed many of the drivers are accustomed to talking on the phone while driving. The test showing the most impairment was the #in-car distractions# (test #3) exam. Test #3 was the hardest because the drivers were required to use a portion of the three skills needed to operate the driving test; cognitive, visual, and manual skills. In the 900 hundred tests given there was 198 total times a driver went off road. Drivers went off-road 35% during test #1, 25% during test #2, & 39% during test #3. There were also a total of 140 crashes. 20% occurred during test#1, 23% during test #2, and %57 during test#3.	
Conclusions/Discussion Drivers using either a cell phone or distracted in-vehicle show measurable levels of impairment. While some drivers drove faster while on a cell phone, more crashes occurred.	
Summary Statement To test the ability of a driver to operate a vehicle while being distracted by cell phones and in-vehicle activities.	
Help Received Dad helped compile data, mom helped type report, Mrs. Serrano helped proofread report.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Jennifer T. Ipe	Project Number J0717
Project Title Did You See That? Subliminal Messaging	
Abstract Objectives/Goals The purpose of my experiment was to see if subliminal messages inserted into videos affect the viewers perception. My hypothesis was that the viewers will be more influenced by subliminal images rather than subliminal words or no words at all. Methods/Materials Using three videos with subliminal images,three videos with subliminal words, and three videos with no messages at all 36 test subjects(who were split up into 3 groups of 12 and shown one of the three groups of videos) were asked to view vidoes and answer a series of questions. Results The results showed that the subliminal images video had the highest number of correct responses while the subliminal word and control group videos received a lesser amount of correct answers. Conclusions/Discussion In conclusion my experiment supports my hypothesis that subliminal images do influence a person's thought process. A big use of subliminal messages is in helping people lose weight,higher self esteem, and quit smoking. It is also used to increase food sales. Subliminal messages are also illegal, subliminal messages aren't allowed to be used on people without there consent or to brainwash.	
Summary Statement My project is about finding out which way subliminal messages work better, as images or words.	
Help Received Teachers helped with deciding where to keep everything on my board. Teachers helped keep control of students during the experiment. Friend helped with downloading videos from YouTube.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Anna E. Killaly	Project Number J0718
Project Title The Effect of Caffeinated Beverages on Problem Solving and Short Term Memory	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Hypothesis 1: Consumers of caffeine will have higher test performance after consuming the beverage than their test performance before consuming the beverage. Hypothesis 2: Performance increase for subjects consuming caffeine will be greater than subjects who do not consume caffeine.</p> <p>Methods/Materials The following materials were needed: a quiet and distraction-free location, volunteers, tape measure, bathroom scale, caffeinated diet Coca Cola, decaffeinated diet Coca-Cola, disposable cups, computer, printer, paper, pens, playing cards and timer. Ten subjects were recruited and completed the experiment. They were randomly assigned to consume caffeinated or decaffeinated diet Coca-Cola. Height, weight, and resting heart rate were measured before completing 3 short tests: math quiz of 25 addition questions of 2 digit numbers, card memory test of matching 5 pairs of playing cards and word memory test from a list of 20 simple nouns. Performance was measured: Math Test (number correct in one minute); Card Memory Test (time to complete); and Word Memory Test (number correctly recalled in two minutes). Subjects blindly consumed 8 ounces of diet Coca-Cola and waited for 30 minutes for absorption. Heart rate was measured and same three forms of tests were repeated but with different questions, cards or word list. Test results were recorded for pre-drink and post-drink and then compared.</p> <p>Results Hypothesis 1 was supported in the math and card memory tests but not word memory test; drinkers of caffeinated diet Coca-Cola performed better on math and card memory tests but worse on word memory tests after consuming the drink. Hypothesis 2 was supported in the card memory test but not in the math test or word memory test; drinkers of caffeinated diet Coca-Cola had greater performance increases than those who consumed decaffeinated diet Coca-Cola only in the case of the card memory tests.</p> <p>Conclusions/Discussion Mixed results suggest that consuming caffeinated beverages does not lead to improved problem solving and short-term memory function. Support for this argument was only seen in the card-memory test, however the support may be because caffeine improves physical reaction time and the speed of turning over the playing cards in this test. The argument that caffeinated beverages improve brain function is not supported by these experiments; students should not use caffeinated drinks to get better grades or cram for tests.</p>	
Summary Statement Do caffeinated soft drinks improve brain functions such as problem solving and short- term memory-recall?	
Help Received Father helped with data analysis.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Jonah L. Kohn	Project Number J0719
Project Title Good Vibrations: Improving the Music Experience for People with Hearing Loss Using Multi-Frequency Tactile Sound	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Most people with hearing loss cannot hear certain frequencies and sounds well or at all, which has a negative effect on their ability to experience music. The objective is to learn whether their experience of music can improve using multiple frequency ranges of tactile sound applied to multiple parts of the body.</p> <p>Methods/Materials The K-MAD (K. Music Assist Device) is an original device invented to conduct this experiment. It divides the sound spectrum into six frequency ranges, each one outputting to a vibrating speaker that is attached to subjects's fingers and/or sternum or combination.</p> <p>Fourteen subjects had their experience of music without and then with the K-MAD tested. Of these 6 were cochlear implant (CI) users and 6 were non-CI hearing aid (HA) users. Two subjects had hearing in normal-range. All subjects except for one CI and one non-CI HA users were younger than 65.</p> <p>Testing lasted over two hours per subject to identify the optimal position of the K-MAD device on their body. Once scores were recorded, subjects' ability to perceive melody, beat and lyrics were also tested. Subjects were asked to write about their experience.</p> <p>Results Using the K-MAD, all subjects with hearing loss, especially younger ones, showed improvement. The best results were recorded by the 4 cochlear implant (CI) users under 55, averaging a 93.5% improvement. The 5 CI-users younger than 65 reported an average 79.2% improvement. The 5 Non-CI hearing-aid (HA) users under 65 showed a 35% improvement. Normal-range hearing subjects reported almost no benefit.</p> <p>Conclusions/Discussion The primary groups who benefit from the K-MAD tactile device are younger cochlear implant (CI) users because tactile senses diminish with aging and CIs with their multiple channels are superior to hearing-aids for discriminating frequencies. Applying multiple frequency ranges to multiple parts of the body appears to help users enjoy a better experience of music by deconstructing the sound spectrum and enabling the user to reconstruct it with their body. Research, confirmed in parts of this experiment, suggests this may work because the K-MAD is providing frequencies that don't overlap those perceived through audio input.</p>	
Summary Statement This experiment is about improving the musical experience of people with hearing loss through multi-frequency tactile sound.	
Help Received Mother and father helped with display board, editing and proofreading, scheduling and driving. Device schematic drawn by electronics technician. Some background of previous research by inventor affiliated with MIT and researcher from House Ear Institute.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Victoria L. Kvitek	Project Number J0720
Project Title Don't Let the Hue Fool You	
Abstract Objectives/Goals My objective was to find out if certain colors could cause the false perception of increased odor intensity. My hypothesis is that subjects will perceive the red gelatin as having the most intense scent, because red is a very vibrant color. I also believe that the yellow gelatin will be thought of as having the least intense scent, because yellow is the lightest color of those being tested. Methods/Materials Five glasses of unflavored, unscented gelatin were scented with a ½ teaspoon of raspberry extract. Using food coloring each was dyed red, orange, yellow, green, or blue. These glasses were taken to Del Monte Shopping Center and set up on a table with 50 surveys. Shoppers were asked to assist in an 8th grade Science Fair project. The subjects then smelled each cup individually and filled out the survey based on what they smelled. Results As hypothesized, red was selected as having the most intense scent by more subjects (40%) than any other color, and the yellow gelatin was selected as having the most intense scent by the fewest subjects (7%), with orange, blue, and green selected by 21%, 21%, and 9% of the subjects, respectively. Conclusions/Discussion I conclude that color can influence our perception and ranking of odor intensity. These results could be applied to advertising. Color alone could cause the desirability to be increased, or at least altered, without having to change the chemical composition of that product.	
Summary Statement My project is about the role of hue on human scent perception.	
Help Received My Dad acted as chaperon when I was surveying people at the shopping center and helped with editing my essays.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Jayden Q. Lotz	Project Number J0721
Project Title Roses Are Red and Violets Are Blue	
Abstract Objectives/Goals My project was to determine if elementary, junior high, or high school students could complete a Stroop Effect test with the fewest errors and with the quickest time. Methods/Materials Three Stroop Effect tests were created with nine words each. The first test consisted of nine colors printed in black ink; the second test had nine colors printed in the same color as they are read aloud; the third test had nine colors printed in a different color that they are read aloud. I then tested elementary, junior high, and high school students after reading to each of them specific instructions. On the third test the student was timed and their errors were counted. Results The elementary students had the fewest errors on average, and the high school students had the quickest time overall. The fastest time without any errors came from the junior high, however. Conclusions/Discussion My conclusion is that outlying times and errors can change the average and outcome. Students from each group had outlying times and errors and changed the results. Human error and carelessness plays a role in the results and outcome of the project.	
Summary Statement This project demonstrates the Stroop Effect and how well elementary, junior high, and high school students can complete a test with minimal errors and a quick time.	
Help Received Transportation from Dad; Mom and Stepdad helped with design of board	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Charlotte B. Monke	Project Number J0722
Project Title Cell Phones and Their Effect on Reaction Time	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if cell phones increase your reaction time.</p> <p>Methods/Materials -iPod touch -Cell Phone with recorded stories</p> <p>Results The average reaction time, without using to a cell phone, was 333 milliseconds. The average percentage of correct answers, without using to a cell phone, was 97.9 percent. The average reaction time, while using to a cell phone, was 607 milliseconds. The average percentage of correct answers, while using a cell phone, was 68 percent. While talking on a cell phone, the amount of milliseconds it took to react, increased by 274. The percent of correct answers went down by 29.9 percent.</p> <p>Conclusions/Discussion My experiment showed that the use of a cell phone does have an effect on reaction times. I found that the student#s reaction times were faster when they were not using a cell phone, because they were not distracted. Reaction time is the ability to respond quickly to a stimulus, although it is important in many daily activities, it is often not measured. My experiment proved that a good reaction time is necessary when completing these daily activities, especially driving. The more distracted the person or the more they have on their mind, the worse their reaction time. That is why I tested students in quite areas, without other people. While driving, people should be especially focused on driving, not on their cell phones. My study proves that if the person is engaged in a conversation, and trying to listen to someone speaking, they will be less focused on driving. My hypothesis was supported because the use of a cell phone increased reaction time. I also found that people have a hard time listening to the phone while completing the reaction time game. They listened better when that was all they were doing. When they had to listen and test their reaction times, some students did poorly at both. Using a cell phone while driving is very hazardous and it should be avoided at all costs.</p>	
Summary Statement My project is about finding the reaction time of student while they are using a cell phone and while they are not.	
Help Received Father helped proof-read board; Teacher helped me get students to test.	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Cole W. Moscaret	Project Number J0723
Project Title Reaction to the Distraction	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine if talking on a cell phone created enough distraction to lower your concentration level.</p> <p>Methods/Materials Materials consisted of 2 cellphones, a hands free cellphone device, a ruler, PVC test setup, 5 conversational questions and reference to a Reaction Time conversion table from a 1987 study by Harold Brody, (Brody analyzed the reaction time of tennis players) The conversion table was used in this study to convert results measured in inches into milliseconds. 40 subjects with informed consent were tested in three different reaction tests. Test 1 was a control with no distraction. Test 2 created a distraction for the subject during the reaction test while holding a phone and talking to my test helper. Test 3 was the same as test 2 however a hands free device was used while talking. The reaction test consisted of a ruler dropped from a stationary position. On a verbal "Go", subjects grabbed the ruler with their thumb and forefinger when the ruler was dropped. Where the subjects caught the ruler was recorded as the "drop distance". This drop distance, in inches was converted to a reaction time in milliseconds using the reaction time table from the Brody study. Reaction times were averaged out for all 40 subjects.</p> <p>Results After comparing the subjects in the three reaction tests, data showed that when compared to the no distraction control test, subjects reaction time decreased by 6% while speaking on a hand held phone during the ruler drop test. The addition of a hands free device was thought to minimize the distraction and improve reaction time. Reaction time for the hands free device however decreased by 6% as well when compared to the no distraction control test. Data also showed that men had a better overall reaction time than the women did.</p> <p>Conclusions/Discussion Based on my results, I accept my hypothesis which stated that I believe that talking on a cell phone will create enough distraction to lower your concentration level. I can apply these results to the real world when it comes to understanding that in order to maximize my safety behind the wheel of a car, I must minimize as many distractions as possible and stay focused on the road. Distractions such as talking on a phone, texting or even a conversation with a friend while driving can be life threatening to myself and others if I am not careful.</p>	
Summary Statement My project was designed to understand the level of distraction that is created while talking on a cell phone and to what degree this distraction has an effect on one's reaction time.	
Help Received My father helped me develop my PowerPoint slides and my mother helped in the construction of the PVC reaction test setup with ruler drop, as well as was my test helper who asked the test subjects conversational questions during reaction tests 2 & 3.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Maya Mundada	Project Number J0724
Project Title Effects of Sensory Distraction on Online Learning	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Online education such as Khan Academy is a new method of study and very different from traditional classroom settings. I wanted to verify which of our 5 senses (sight, sound, taste, touch and smell) is most sensitive to distraction when using an online education method. My hypothesis was that the distraction of all five senses will affect accuracy, but visual distraction will affect it the most. This is because online computer education requires the child to be attentive to the computer screen.</p> <p>Methods/Materials I obtained Informed consent from parents of 24 kids. My material included six computers with access to Khan Academy, an iPad for playing a movie with subtitles, an iPod for music, butter popcorn, ice cream, and a cold room to distract the 5 senses. I made 24 kids each take a total of 36 Khan Academy tests while undergoing distractions of all 5 senses and one baseline reading without distraction. Then, I computed averages. To guarantee precision, I repeated the experiment four times, with group of 6 kids each.</p> <p>Results The results showed that the average results were the worst with sight distraction. The results also showed two other unexpected findings; both sound and taste distractions average results were better than baseline results. Given the large sample size of 864 readings, my experiment is statistically significant assuming normal distribution and the findings are quite conclusive.</p> <p>Conclusions/Discussion Sight did produce the worst distraction. Thus, part of my hypothesis was correct. However, I had also hypothesized that all distractions would produce worse than baseline results. That part of the hypothesis was incorrect. Both sound and taste produced better results than the baseline results. This means that kids should avoid visual distraction during online education. The results also indicate that sound and taste distraction improve results. I would suggest a follow-up experiment to determine the effects of those.</p>	
Summary Statement My project provides conclusive evidence on distraction of human senses during online learning.	
Help Received 24 anonymous kids for taking 36 tests each	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Grace L. Patel	Project Number J0725
Project Title Who Makes the Best Multitasker?	
Abstract Objectives/Goals This study tested if gender, piano playing, use of T.V. use of the computer, or use of texting affects how a person multitasks. Methods/Materials Each test subject filled out a questionnaire and signed a consent form. Next, they completed an online test connected to previous Stanford University research, which had 6 practice problems and 20 scored problems. Results No single category of people were good multitaskers. Each category was just better at one part of multitasking. In other words, if one category was fast to perform a task, they would be slow and less accurate to switch tasks. The best multitasker would be someone with a low switch cost and a low answer time, but no category achieved this. Age, however, did affect the results. For the older test subjects, multitasking or task switching became more costly in terms of time and accuracy. Conclusions/Discussion While it could not be concluded whether gender, piano playing , use of T.V., use of computer, and use of texting affects how one multitasks, age did affect how well the tasks were performed. The younger people were more accurate and time efficient when they switched tasks. In a classroom or other learning environment, teachers could use this knowledge and give their students multiple short activities during the class period, instead of one long activity.	
Summary Statement This project is about how characteristics such as age, gender, piano playing and media use affect a person's ability to multitask.	
Help Received Mom and Dad helped analyze the data, my teacher Mrs. Culley helped find the Stanford test I used, the researchers at Stanford created the online test under the direction of Dr. Richard Nass.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Kendall Robison	Project Number J0726
Project Title Taste the Power of Smell	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The hypothesis of this experiment is if a person is not able to smell, then they will not identify food because the cerebral cortex will not recognize the substance.</p> <p>Methods/Materials Materials Used: Nose plug, blind fold, masher, sharp knives, cutting board, Dixie cups, kitchen area, peas, onion, gluten free pretzel sticks, grapefruit, orange, Hershey Chocolate bars, lemon juice, candy canes/peppermint, and 24 people</p> <p>Project Method: Consent was given from the 24 people that were randomly selected from the ages of 5 to 79. Each test subject was brought into a room where they were given a blind fold and a nose plug to wear. Then they proceeded to eat each of the eight foods that had been mashed up by the experimenter. When the subjects described and attempted to guess the foods, the experimenter wrote them down in the lab notebook. The test was then given to the subject again, but without the nose plug to compare them.</p> <p>Results The data shows that there is a 22% increase in accuracy of identifying food from without smell to with. When the data was split up into the different categories: whole group, under 21, over 21, male and female, it showed that females had the highest average accuracy in with smell and without. With smell females had an average of 6.63 and without smell 6, while males showed the greatest improvement of 35% from 4.38 to 5.92.</p> <p>Conclusions/Discussion The results stated above supported the hypothesis because of the 22% average improvement of the whole group. This showed the experimenter that smell definitely affects the way people taste. The data indicates that males depend more on their sense of taste than females. This experiment may be useful to individuals who have lost their sense of smell by helping to identify what foods their brain can recognize through taste alone.</p>	
Summary Statement This experiment shows that olfactory senses are important in enhancing gustation.	
Help Received Dad helped organize board; teacher mentor helped guide project	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Benjamin H. Shaw	Project Number J0727
Project Title Placebo: To Believe or Not to Believe	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine if the use of a placebo energy chew would impact the free throw performance of an average sixth grader.</p> <p>Methods/Materials Parent participation consents were signed by nine sixth graders of which four were boys and five were girls. Individual starburst candies were repackaged with FRS-branded foil covers. The free throw performance of each participant was measured prior to the use of the placebo. Following the first set of free throws, the students were given one placebo disguised as an FRS chew and were introduced to the FRS product through its online marketing material and website. After fifteen minutes, the students performed a second free throw test and the results were measured. The overall free throw performance improvement and reduction were measured for all students. The data was also divided by gender to see if there was a statistical difference when looking at boys versus girls.</p> <p>Results Across all the students, the number of free throws was greater by 2.22% after taking the placebo. When looking only at the percent of kids that improved, declined or did not change, 33.3% of students improved while 44.4% declined and the remainder stayed the same. The 33.3% improvement is consistent with the research on placebos but the 44.4% decline is not typical. When looking at performance by gender, the boys overall improvement in performance was greater by 5% driven by a big improvement by one individual child. When calculating to see if the difference was statistically significant, the results showed that there was no statistical difference by gender.</p> <p>Conclusions/Discussion The results of my experiment negated my hypothesis that the use of the placebo would improve every student's free throw performance by one additional basket. While my experiment was consistent with scientific data where 33.3% of the students improved with the placebo, the misperception about how students should feel after taking the energy chew had an even more powerful impact on the results. Since some were expecting an immediate surge of energy and did not feel it, students felt tired and blamed their performance on feeling tired. I also concluded that the use of placebo in this experiment had the same statistical impact across boys and girls. The data suggests that when using a placebo, it is important to be very clear about the immediate side effects of the placebo to set expectations correctly.</p>	
Summary Statement The placebo effect and its impact on sixth graders' free throw performance.	
Help Received My step-mom suggested I use starbursts as my placebo and helped me disguise the starburst using FRS energy chew packaging.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Andrew A. Shen	Project Number J0728
Project Title Distracted Drivers	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to quantitatively measure how much texting while driving affects a driver's reaction time.</p> <p>Methods/Materials To test my hypothesis, I designed and created a two-part program that simulates driving with and without texting. The program was written using the Scratch programming language (from MIT).</p> <p>To simulate driving without texting, a pedestrian appears randomly on the screen every 10-20 seconds, and the driver is instructed to hit the break button when he/she sees the pedestrian. The driver's reaction time (the time from when the pedestrian appears to when the driver hits the break) is recorded by my program.</p> <p>To simulate driving while texting, the same procedure is repeated with an interactive chat box added. The driver will answer basic questions from the chat box while trying to hit the brake as soon as possible when pedestrians appear.</p> <p>I had 24 different people test my program, with 5 trials per person, and all reaction times were recorded.</p> <p>Results Every driver's reaction time was slower when texting, and the average reaction time was 141% slower when texting.</p> <p>Conclusions/Discussion My data showed that texting while driving dramatically slows down drivers' reaction time. My project provided an easy, safe, and fun way to test the effects of texting without having to put drivers on a real road.</p>	
Summary Statement In this project, I created a simulation program that can quantitatively measure the effect of texting on driver reaction time in a safe and fun way.	
Help Received teacher gave feedback on experiment, mom gave feedback on the simulation program, friends and neighbors help test the program	



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Caitlin E. Takeda	Project Number J0729
Project Title Does Brain Hemispheric Dominance Affect Visuospatial Ability?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project was to determine if brain hemispheric dominance affects a person's visuospatial ability. I became interested in this topic because I am left-handed and the other three members of my family are also left-handed and we all enjoy art and creative projects. I have heard that left-handers are supposed to be more artistic and creative because the right hemisphere of their brain is dominant. I wanted to find out if this myth was true.</p> <p>Methods/Materials 400 people were given a 5-part, timed questionnaire I developed to test several visuospatial skills. In doing so, I hoped to obtain a measure of a person's artistic ability. The questionnaire was designed to test a subject's ability to 1) draw a 3-dimensional object, 2) determine the orientation of an object in space, 3) visualize "white" or "empty" space, 4) perform "mirror writing", and 5) see a pattern in a series of visual images and predict the next image. I analyzed the data using independent variables of age, gender, and hand, foot, and eye dominance. Also, hemispheric dominance, defined by the degree of either left or right-sided dominance, was considered. The dependent variable was their score on the questionnaire.</p> <p>Results Left-handers scored significantly higher on the questionnaire than right-handers ($p = .0006$). Also, left-foot and left-eye dominant subjects scored significantly higher than right dominant subjects ($p = .0006$, $p = .005$). When brain hemispheric dominance was considered, Major Right Brain Dominant (LLL) subjects scored significantly higher than Major Left Brain Dominant (RRR) subjects ($p = .006$). And the greater the degree of right brain dominance, the higher the score. When age was considered, the older the subject, the higher their score. The "older than 8th grade" group scored higher than the 8th, 7th and 6th grade groups but the difference was not significant ($p = .281$, $.063$, $.053$). Females scored slightly higher than males, but the difference was not significant ($p = .345$).</p> <p>Conclusions/Discussion My hypothesis was correct. Brain hemispheric dominance does have a significant effect on visuospatial ability. And, if accurately drawing a 3D cube is a measure of artistic ability, the more right brain dominant you are, the greater your artistic skills. In other words, left-handers are more artistic than right-handers.</p>	
Summary Statement This study evaluates the relationship between brain hemispheric dominance and visuospatial skills, which are components of artistic ability.	
Help Received My mother assisted me in scoring some of the questionnaires and editing my report. My father taught me how to use Adobe Photoshop and Microsoft Excel. Several teachers at Medea Creek Middle School allowed me to administer the questionnaire to students in their classes.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Finn Thomas	Project Number J0730
Project Title How Does Brain Dominance Correlate with Auditory Logic Processing?	
Abstract Objectives/Goals The purpose of my project was to determine how hemisphere dominance correlates with auditory processing involving logic performance. Methods/Materials The experiments involved writing a program that would target right/left hemispheres while testing logic analysis involving auditory input. Headphones were used for instruction to the right ear, targeting the left hemisphere, and to the left ear, targeting the right hemisphere. The listener would then process what they had heard and make an appropriate response on the computer program. The program would then analyze their responses, calculate the time required to complete its tasks, and identify how successful each hemisphere was at those tasks. The program also looked for patterns and correlations between a person's brain dominance and logic performance. The materials that I used were: Computer Program that I wrote to conduct the test, earphones, computer, paper, and pens. Results The results of my experiments showed that the right side of the brain was better at logic performance than the left. My hypothesis was that the left hemisphere would be better. Conclusions/Discussion The experimental data did not support my hypothesis. Instead, the data showed that people's right side of the brain was faster than their left hemisphere. I believe that the results might have come out like this because the test that I designed required the subject to identify colors. In my research I discovered that there is a part of the brain on the right hand side that deals with colors and maybe that is why the results came out this way. I also found that girls that took my test were better and faster at logic performance than boys were. I think that this came out like the way it did because I have heard that girls can jump between their two brain hemispheres easier than boys can.	
Summary Statement My project was to identify how brain dominance correlates with auditory logic processing by creating a computer program.	
Help Received Dad taught me how to make the computer program and my teacher helped me with format.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Nicole E. Veloskey	Project Number J0731
Project Title Impact of Flashing vs. Continuous Lights on Reaction Time	
Abstract Objectives/Goals This year my family was involved in an automobile accident. The purpose of my project was to show if flashing brake lights were added to cars, would this decrease the number of car accidents significantly. I believe that this is relevant because 80% of car accidents are fender-benders, probably because the driver couldn't see the person braking in front of them. Methods/Materials To conduct my experiments, I decided that I would create a computer program to test the reaction time of the test subject with flashing and still lights. Overall, I tested about 50 people and then averaged the data to find my final results. Results After analyzing my test data, it unfortunately did not support my hypothesis. The average reaction time of all the test subjects were within 5% of each other, which didn't show any difference between the flashing and still lights. The participants probably reacted to the light immediately in my test whether it was flashing or not. Conclusions/Discussion I believe that my results turned out the way they did because unlike other people that have researched this topic, I used a computer program instead of actual cars. Had the test been more like a real-world situation, perhaps the results would have been different. Interestingly, I found that the participants over the age of 40 in my experiment had significantly faster average reaction times than the participants under age 40.	
Summary Statement I created a simulation test to see if flashing lights might make drivers more attentive to brake lights.	
Help Received Father helped with learning Scratch programming; test volunteers	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Sophia A. Walker	Project Number J0732
Project Title The Memory Game	
Objectives/Goals How accurate is eye witness testimony. The hypothesis for this experiment is that eyewitness testimony will not be accurate because memory is not an exact science.	
Abstract	
Methods/Materials Materials: 1) A volunteer to act as the criminal; 2) Clothing selected for the individual to wear; 3) A script for the volunteer; 4) An item for the criminal to take during the experiment. (same item must be used for all the trials); 5) A photo of the individual that participated in the experiment and two other photos to use in photo line up. A total of three photo#s of individuals dressed similar for witnesses to identify the criminal; 6) A questionnaire with multiple choice questions about the incident and the criminal. Procedures: 1. Write script for the actor to follow during the experiment. 2. Select clothes for the individual to wear and/or items to carry. 3. Make photos of the clothes, apparel and items carried by the actor. 4. Select item to be stolen. 5. Make photos of the item that is being stolen. 6. Complete questionnaire. 7. Make arrangements with school for actor to enter three classrooms on the same day. 8. Immediately after incident, pass out the first questionnaire to all 87 students. 9. Two week after the incident I will pass out a second questionnaire, with photo line up attached. 10. Three weeks after the incident I will pass out a final questionnaire, with photo line up attached. 11. Compare results of the students from each of the total 284 questionnaires.	
Results Over all, only one subject consistently answered every question correctly. By percentage, the 10 year olds were the most accurate in the line-up at 92%; then 14 years olds at 85%; 11 year olds at 68%; 12 year olds at 59% and 13 year olds at 38%. In the first trial only 4.26% of the eye witnesses identified that the intruder wore a ski cap, in the 2nd trial that dropped to 3.48%, in the final trial it dropped to 0.77% (less than 1%). Where as 12.40% of eye witnesses identified grey hair in the first trial, it dropped to 11.62% in the second trial and jumped to 17.05% in the final trial. Combining all data such as hair color, eye color, and clothing the overall accuracy dropped below 50% and in some cases below 30%.	
Conclusions/Discussion The experiment supported the prediction that eyewitness testimony would not be accurate. Based on the data collected, inconsistencies were staggering between eyewitnesses individual questionnaires and overall data.	
Summary Statement This project is a study of the accuracy of eye witness testimony over time.	
Help Received Mom helped paste together my board. Mr. Hobbs helped coordinate the crime during school.	



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Lucy E. Zicarelli	Project Number J0733
Project Title I Thought I Knew That! The Effect of Fonts on a Person's Memory	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project is to examine the effect of different types of fonts on a person's memory. The results of my experiment can help students who need help with studying vocabulary words, history notes, or just memorizing a certain math concept.</p> <p>Methods/Materials Computer, printer, 25 subjects, paper, timer, pencil. I had 25 people look at a list of words (coffee, fence, binder, pencil, tree, apple, piano, roller skates, spoon, lettuce, pilot, and television) for one minute in one of the five fonts Times New Roman, Times New Roman Bold and Italicized, Mistral, Edwardian Script JCT, and Party LET. After that, they wrote down the words they could remember in order on a separate piece of paper. Finally, I collected the results and recorded them in a table.</p> <p>Results The people who used the font Mistral and Party LET had the highest average recall out of all of the fonts; 56% correct on average for Party LET and 53% correct on average for Mistral. Tying for third were the fonts Times New Roman and Times New Roman Bold and Italicized, both averaging 46%. The font Edwardian script JCT averaged the lowest at 35% correct. The people who were in the group that used Edwardian script JCT got lower scores (15% and 25%) which lowered the average. There was also a person who got 100% which was an outlier to the other scores in the group Times New Roman Bold and Italicized. Many of the other people in this group scored around 20 percent or lower.</p> <p>Conclusions/Discussion My data supported part of my hypothesis. Less common fonts, Party LET and Mistral, were easier for people to remember. However Edwardian Script had the lowest recall rate, even though it is an uncommon font.</p>	
Summary Statement I looked at how different types of fonts affect a person's ability to memorize a list of words.	
Help Received	