



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Madalyn E. Berry</b>	<b>Project Number</b> <b>J0401</b>
<b>Project Title</b> <b>At What Grade Level Do Children Start to Develop a Gender Bias towards Various Occupations</b>	
<div><b>Objectives/Goals</b> The objective of my project is to discover when and if children develop a gender bias towards different day to day occupations.</div> <div><b>Methods/Materials</b> I needed to make 8 display papers each with 2 male and 2 female pictures to test the kids with. I also needed to make data sheets to record the kids' responses, and I needed 10 girls and 10 boys from each grade level (K-8) to be my test subjects.  After creating the display papers and data sheets listed above, I randomly selected 10 girls and 10 boys from a Kindergarten class and individually tested them. I showed them the display papers one by one and asked them which they thought did the job listed at the top. I then did the same things with grades 1-8. After collecting my data, I tallied the number of female pictures chosen and the number of male pictures chosen for each job in each grade level. I then turned these tallies into double bar graphs to show my results.</div> <div><b>Results</b> At the end of my experiment, I found that each grade level showed a gender bias towards each occupation. There were some biases that surprised me. For instance, a bias was shown towards females being a doctor when I expected males to be favored. A reasonable explanation came to light though because most pediatricians are females.</div> <div><b>Conclusions/Discussion</b> My results have shown that kids do show a gender bias towards different occupations. My project can be applied to the real world because it provides evidence that gender bias is real in children. I believe that this gender bias develops partly because in a picture book teachers are generally female and pilots are generally male, which shows a kind of traditional gender bias. This can be prevented if illustrators of children's books didn't always use that traditional gender bias. Gender bias is starting to slowly go away in society. For example, news anchors used to always be male, but ABC 30 Action News has multiple female news anchors such as, Graciela Moreno and Liz Harrison. Also, sports reporters were always male, but Erin Andrews was a main reporter at the 2014 World Series. This will help the gender bias slowly go away if we start showing new generations that you can be anything you want to be.</div>	
<b>Summary Statement</b> The purpose of my project was to determine when children start to show a gender bias towards different occupations.	
<b>Help Received</b> Dad helped with graphs; Mrs. Loflin helped with research.	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Alexis J. Block</b>	<b>Project Number</b> <b>J0402</b>
<b>Project Title</b> <b>Does the Golden Ratio (1.618) Predict People's Opinion of Beauty?</b>	
<div><b>Objectives/Goals</b> The goal was to determine if people with facial features that are consistent with the Golden Ratio (<math>\phi=1.618</math>) are regarded as more beautiful than people whose facial features have the greatest variance from the Golden Ratio.</div> <div><b>Abstract</b> The materials used were SurveyMonkey, 50 internet photos, Social Media (Facebook, Twitter, Email), Microsoft Excel. An online survey was created using SurveyMonkey, with the 50 random color photos inserted into the survey. The survey was posted on social media. Raw data collected from the survey was analyzed to determine which photos were rated as the most beautiful and the least attractive (1 to 5). Each of the 50 photos were measured with a metric ruler (e.g. top of head to chin, top of head to pupil, pupil to nose tip, etc) to determine 12 separate facial feature measurements. Ratios of the facial feature measurements were entered into Microsoft Excel and compared to the Golden Ratio. The absolute value variance between the Golden Ratio and each facial ratio was calculated, compared to the survey ranking, and graphed.</div> <div><b>Methods/Materials</b> The materials used were SurveyMonkey, 50 internet photos, Social Media (Facebook, Twitter, Email), Microsoft Excel. An online survey was created using SurveyMonkey, with the 50 random color photos inserted into the survey. The survey was posted on social media. Raw data collected from the survey was analyzed to determine which photos were rated as the most beautiful and the least attractive (1 to 5). Each of the 50 photos were measured with a metric ruler (e.g. top of head to chin, top of head to pupil, pupil to nose tip, etc) to determine 12 separate facial feature measurements. Ratios of the facial feature measurements were entered into Microsoft Excel and compared to the Golden Ratio. The absolute value variance between the Golden Ratio and each facial ratio was calculated, compared to the survey ranking, and graphed.</div> <div><b>Results</b> The survey data and graphs showed that there was no consistent trend between rankings of beauty selections and facial features that had the smallest absolute value variance to the Golden Ratio. The data was further sorted as follows: male survey takers rating males, male survey takers rating females, female survey takers rating males, female survey takers rating females; survey takers ages 8 and 25, 25 and 45, and 45 and 75. Each of the data sets selected above ended up with inconsistent results similar to the larger data set.</div> <div><b>Conclusions/Discussion</b> It was anticipated that survey participants would select beautiful faces based on facial features with the smallest variance to the Golden Ratio. However, the survey takers selected the photo with the smallest absolute variance to the Golden Ratio only 68.75% , with 18 to 24 year olds predicting the most accurately at 26.9%. The lack of a clear connection appears to indicate that survey takers select photos based on personal preferences outside of facial measurements. This could have been one of the errors in the hypothesis, as beauty may be based on personal preferences such as hairstyle, make up, race, or the color of the clothing.</div>	
<b>Summary Statement</b> In my study of "attractiveness", the math behind the Golden Ratio (1.618) and personal preference (ranked by 208 survey takers) approximated the Golden Ratio 68% of the time.	
<b>Help Received</b> My online survey was completed by 208 people; My dad helped find a survey software and helped analyze my raw data; My mom helped me purchase the supplies for the board, proofread the text and and helped assemble my board.	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Camden J. Breaux</b>	<b>Project Number</b> <b>J0403</b>
<b>Project Title</b> <b>The Effect of Peer Pressure on Truth Telling</b>	
<div><div><b>Objectives/Goals</b> The objective of this experiment was to see if young adolescents would tell the truth when under peer pressure.</div><div><b>Methods/Materials</b> Two batches of brownies were made following the same recipe, except brownie "B" had a large amount of salt added, less sugar and chocolate chips, and vanilla omitted to make them less sweet and more salty than brownie "A". Students, from 4th grade to 8th grade, were asked to taste both brownie "A" and "B" and tell the researcher which brownie they liked best. Prior and during the brownie tasting, the researcher would recite a peer pressure script encouraging the student to like brownie "B" as it was the researcher's favorite brownie made by his grandma and her special recipe. Results were recorded and later analyzed.</div><div><b>Results</b> The results of this experiment showed that the peer pressure did cause the majority of students, 63% of the 68 students, to conform to the researcher and pick brownie "B" despite its salty and less sweet taste. Five out of six 4th-5th graders chose brownie "B" and 38 of 62 6th-8th graders chose brownie "B".</div><div><b>Conclusions/Discussion</b> The results of this experiment did support the hypothesis with 63% of the 68 students chose brownie "B" to be their favorite. Young adolescents, up to 14 years old, are highly susceptible to peer pressure. The size of the group involved in the peer pressure can effect conformity to peer pressure. This experiment was performed at church where truth telling is upheld as a strong character trait and could have been a variable affecting results. It was learned that peer pressure does affect young adolescents and it is important to choose our words wisely before speaking. It takes courage to tell the truth when faced with peer pressure.</div></div>	
<b>Summary Statement</b> My project is about the difficulty of telling the truth when pressured by a peer to do or say otherwise.	
<b>Help Received</b> Mother helped type the report and used scrapbooking tools to design the layout of the board.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> Nagee N. Clowney	<b>Project Number</b> <b>J0404</b>
<b>Project Title</b> <b>Color Thoughts: Word Color Association, Part 2</b>	
<div><div><b>Objectives/Goals</b> The purpose of my project was to determine if there were trends in how people, based on race and ethnicity, associated certain colors with positive and/or negative words.</div><div><b>Methods/Materials</b> I designed the survey. Based on my previous research, I decided to use Cluster Sampling again to select which group of students to survey. I randomly drew nine teachers' names. I completed the Certification of Compliance for Research Involving Human Subjects. I submitted my research plan. I got approval from my project advisor, principal and teachers to distribute surveys to students in selected homeroom classes. I distributed the surveys. I collected the surveys and tallied the results. I reviewed and compared the results from both cohorts to see if there were any correlations with how people viewed colors. MATERIALS: Pencils, Letters Requesting Approval; Surveys, Tally Sheets</div><div><b>Results</b> I collected 150 surveys from the 2014-15 cohort (10.5% of the school's student population) and 249 completed student surveys from the 2013-14 (17.4% of the student population). Red received the highest number of votes related to negative words. Black received the second highest number associated with negative words. Both years, black received the lowest number of votes associated with positive words. Blue received the highest number of positive votes with green and purple also scoring high.</div><div><b>Conclusions/Discussion</b> The experimental results partially supported my hypothesis that when people are presented with a list of descriptive words and choices of colors, they will frequently associate positive words with blue or white and negative words with black or brown. In order to determine if there were trends in people's association of words with certain colors, I developed a survey with a combination of positive and negative words and color choices. When controlling for race, I thought black would have the highest association with negative words. Instead, it had the second highest number of responses overall compared to red. These finds were consistent with what the findings were based on gender. I also thought that more people would associate positive words more often with blue or white. While blue received the highest number overall for positive responses, the next color most frequently associated with positive words was green and purple.</div></div>	
<b>Summary Statement</b> This project uses cluster sampling to survey a random group of students to determine if people's association with certain words to colors is influenced by popular social norms and cultural perceptions.	
<b>Help Received</b> Mother helped type report; Teachers distributed surveys; Mother's co-worker showed how to do pie charts in Excel	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Justine Dominic D. Encontro</b>	<b>Project Number</b> <b>J0405</b>
<b>Project Title</b> <b>Money and the Mind: How Does Someone's Economic Situation Affect Their Moral Decision Making?</b>	
<b>Objectives/Goals</b> The purpose of this project was to find out how the factor of money in a person's situation affects the way they make moral decisions.	
<b>Abstract</b> <b>Methods/Materials</b> In this experiment, I created 5 different scenarios with different economic levels written out in each along with a event that would remain unsolved. Upon the completion of a final draft, I gathered a total of 30 subjects, each of whom received 1 consent form to confirm their participation. They would then be given 1 of 30 copies for each of the 5 scenarios written on paper that they would read, analyze and respond to in any way they deemed necessary by writing down their next possible action. I then evaluated each response and recorded the data on a computer to determine whether it was "moral" or "immoral" based upon a rubric where any responses that harmed others or solely benefitted the subject were considered "immoral," while anything in between or having no affiliation with this issue was "moral."	
<b>Results</b> Only 7 of the 30 of the subjects managed to only make 1 or no harmful decisions, while the other 23 subjects managed to make 2 or more of harmful decisions. Using this information, it was confirmed that the percentage of #moral and immoral# people reached 76.7% while only 23.3% of the 30 subjects remained #moral.# The most common trend was that most of the subjects tended to make better decisions morally in poorer economic situations.	
<b>Conclusions/Discussion</b> Knowing that the project supported the hypothesis I had made that 70% of subjects would be immoral, and knowing the trends listed above, I reached the conclusion that people in the middle class generally make better moral decisions in poorer situations rather than rich ones. If I were to continue this experiment, I would like to investigate how different economic backgrounds of subjects affect response types. I would also like to find out how the language put into the creation of a scenario affects how a subject will respond.	
<b>Summary Statement</b> My project was created to find out exactly how greatly money effects moral decision making, and I did this through the creation of 5 scenarios in which 30 subjects would read and free write a response.	
<b>Help Received</b> Was advised on how to put together and present my project by Ms. O'Keefe; Assisted by parents to find willing subjects and put together board	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jessica S. Fairlie</b>	<b>Project Number</b> <b>J0406</b>
<b>Project Title</b> <b>Jobs and Gender: Implicit Assumptions about Women in the Workplace</b>	
<div><div><b>Objectives/Goals</b> The purpose of my experiment is to see if people think that women typically have lower paying jobs than men. Women still face bias in the workplace and some people who would not admit to being biased might still have a view that women should have lower paying jobs than men. Since women are now more common in high paying professions, this assumption is changing over time. My questions are: Do people still have a subconscious bias about women in the workplace? Do adults and children differ in their subconscious bias about women in the workplace? Do people take longer to associate women with high paying jobs? and Do adults take longer to associate women and high paying jobs than children do?</div><div><b>Abstract</b></div><div><b>Methods/Materials</b> My test involves a deck of cards that you sort into two different piles. These cards include high and low paying jobs and names relating to females and males. My procedures are have my volunteers sign human subjects forms, have them take the color practice test and time it, randomize the layout with the category cards, have them take the test and time it, switch the category cards and have them take it again timed, and record each time in my notebook. There are two tests, each with a different deck of cards. I will test my hypothesis by calculating how much longer it takes for people to sort cards into women and high paying jobs vs. women and low paying jobs. I decided on 20 high paying jobs out of the top 100 jobs from the Bureau of Labor Statistics. I also decided on 20 low paying jobs out of the 100 lowest jobs. I came up with 20 names relating to females such as Grandmother and Rebecca. I also came up with 20 names relating to males such as Grandfather and Robert. Each word has its own card and makes up the decks.</div><div><b>Results</b> Most participants took longer to sort cards when it was women and high paying jobs than when it was women and low paying jobs. On average adults took more time to sort cards into women and high paying jobs than children did. The children didn't show much preference with a certain gender and job pay.</div><div><b>Conclusions/Discussion</b> My results supported my hypotheses. Adults took more time to sort cards into women and high paying jobs, but children didn't. This means that adults typically have an subconscious bias against women in the workplace. Children don't have this subconscious bias.</div></div>	
<b>Summary Statement</b> My project is about seeing if your age affects your implicit assumptions about women in the workplace.	
<b>Help Received</b> Parents helped me find subjects to test.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>McKenna G. Grant</b>	<b>Project Number</b> <b>J0407</b>
<b>Project Title</b> <b>Birth Order Effects on Leadership</b>	
<div><div><b>Objectives/Goals</b> My objective was to learn if birth order effects leadership.</div><div><b>Methods/Materials</b> First, have students fill out a survey that asks their name, gender, birth date, birth order, height, and eye color. Then make groups of three eighth graders having an oldest, middle, and youngest sibling in each group. (Students in the groups are not related to each other.) Tell each group they have to complete a task of standing on a piece of 2' by 3' carpet and flip it over without any part of their body touching the ground. The objective is to do this as fast as possible within a three minute time limit. While they are doing their activity listen to them talking. Record the amount of commands each subject gives while doing the task. Then repeat this process with each of the groups and analyze the data by the amount of commands each sibling type gives. The sibling type with the most commands given is an indicator that they have the most leadership.</div><div><b>Results</b> My results showed that the middle siblings gave the most commands on average. My results also showed that the tallest people in every group on average gave more commands than the shorter people in each group. Another thing I realized while doing my experiment was that males were almost twice as commanding as females. However, there was a large standard deviation which suggests that this experiment is not statistically significant.</div><div><b>Conclusions/Discussion</b> The conclusion does not support the hypothesis that the oldest siblings show the most leadership. In the task I gave, a lot of cooperation was involved. The middle siblings might have given the most commands because studies show that middle siblings have peacekeeper personality traits and are good with cooperation. If more research was done, we might be able to see which sibling type shows the most leadership in tasks involved with cooperation.</div></div>	
<b>Summary Statement</b> This project was designed to test how birth order effects leadership.	
<b>Help Received</b> Science teacher provided mentorship.	





# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Cecilia A. Hanna</b>	<b>Project Number</b> <b>J0408</b>
<b>Project Title</b> <b>Face Value: How Facial Appearance Plays a Roll in Political Elections</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project is to determine if, and if so, how strongly, facial appearance can affect the outcome of political elections. <b>Methods/Materials</b> Official portrait photos of the winners of 10 various mayoral and gubernatorial elections from states and cities across the United States of America were placed on sheets of paper next to portrait photos of their largest opponent in their election. 60 test subjects were asked whom they would vote for based entirely on the candidates' portraits for each of the 10 elections. The results of the election based on portrait photo alone were then compared to the results of the actual election. <b>Results</b> 58% of the time, test subjects voting purely on facial appearance would vote for the candidate that won the election. This shows an 8 point increase from the null hypothesis. As the standard deviation includes the null hypothesis, it cannot be concluded that facial appearance definitely plays a roll, but the data trends towards a fairly strong influence. In 3 of the 10 elections, the experiment showed a statistically significant increase in votes correlated to facial appeal. In those 3 elections, approximately 81% of the subjects voted for the winner based on appearance. <b>Conclusions/Discussion</b> The experiment showed trends towards facial appearance being a fairly strong variable in politics. Most elections are won within 1-2 points of each other, and 8 points can be an insurmountable gap. The results neither directly confirmed nor contradicted my hypothesis, as it was included in the standard deviation, but the data showed a trend towards confirming the hypothesis, the experiment suggests that people make important judgments based on appearance, and shows how frequently our subconscious judgments factor into large decisions, such as our choice of leaders.	
<b>Summary Statement</b> This experiment tested how strongly facial appearance factors into political elections; data showed an 8 point advantage towards candidates whom voters found more appealing, which can strongly affect and even win the election.	
<b>Help Received</b> Friend helped conduct survey; father helped design data analysis spreadsheet.	





# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Travis C. Joyce</b>	<b>Project Number</b> <b>J0409</b>
<b>Project Title</b> <b>Slow Your Roll!</b>	
<div><div><b>Objectives/Goals</b> The goal of this experiment was to see which positive distraction, on or near a local neighborhood street, caused the the greatest number of vehicles to to obey the law, by maintaining the 25 mile per hour speed limit. By doing this test, state officials have a source to look at to see what positive distraction(s) to place throughout neighborhood streets, that will actually have an affect on drivers.</div><div><b>Abstract</b></div><div><b>Methods/Materials</b> To procede in this experiment, one must have a radar gun, official looking person, children at play sign, and a speed bump. The radar gun measures how fast on object, such as a car, is traveling. The other three essential materials, are the positive distractions being tested.</div><div><b>Results</b> The positive distraction that caused the greatest number of vehicles to maintain the speed limit, was the speed bump on the street. Forty out of sixty cars monitored, maintained the 25 mile per hour speed limit.</div><div><b>Conclusions/Discussion</b> State officials now have a source to look at to see which positive distraction has the greatest affect on drivers. They do not have to spend thier money placing distractions into neighborhoods that have no affect on drivers, Instead, they can take and utilize these results to determine what to place into neighborhoods similar to the one that was tested.</div></div>	
<b>Summary Statement</b> The goal of this experiment was to see which positive distraction, on or near a local neighborhood street, caused the the greatest number of vehicles to to obey the law, by maintaining the 25 mile per hour speed limit.	
<b>Help Received</b> Mother assisted with board; Aunt helped with graphs; Cousin helped in finding title.	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Haritha Kahf; Baer Yemut</b>	<b>Project Number</b> <b>J0410</b>
<b>Project Title</b> <b>Do You Agree?</b>	
<div><div><b>Objectives/Goals</b> The idea for our conformity experiment sparked one day at school when we began to notice that during a class vote, many people changed their vote to fit the majority. We wondered as to whether this was more prevalent in a specific age group and assessed this concept by asking the question, #Which age group has the highest rate of conformity?#</div><div><b>Methods/Materials</b> <b>MATERIALS</b> 1 Journal 35 Papers 2 Pencils 35 Adult Test Subjects 40 Teenage Test Subjects 40 Kid Test Subjects 5 Whiteboard Markers 50 Pieces of Chocolate/Candy (variety of types) 1 Whiteboard 1 Roll of Tape 4 Sets of Quizzes/Questions 1 A,B,C Line Diagram 4 Lines 3 Lists of Groups We tested three different age groups, adults ages eighteen and up, teenagers ages twelve to fourteen, and children ages three to six. We used a different procedure for each group, and tested thirty five adults, forty teenagers, and forty children.</div><div><b>Results</b> Both teenagers and children had the same rate of conformity, which was 37.5 percent.</div><div><b>Conclusions/Discussion</b> Both children and teenagers conformed the same amount. This proved our hypothesis half correct. Also, the adults seemed to conform less than both the children, teenagers, and Asch's results.</div></div>	
<b>Summary Statement</b> For our project we studied the human concept of conformity, the tendency to change ones behaviors and thoughts based on that of a majority in three age groups, children, teenagers, and adults.	
<b>Help Received</b> Mrs. Joseph, science teacher,call owed us to use her classroom to conduct the experiments.	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Atif U. Khan</b>	<b>Project Number</b> <b>J0411</b>
<b>Project Title</b> <b>No Pain, Lots of Game</b>	
<div><b>Objectives/Goals</b><p>The objective is to test if video games can prove to be a strong enough mental distraction to help improve an individual's ability to tolerate discomfort. My hypothesis is that during video game play, volunteers would experience lowered discomfort levels and increased tolerance time relative to their control trials, with no video game distraction.</p><b>Methods/Materials</b><p>The materials for this experiment include a bucket of ice water (35°F), two towels, a thermometer, a stopwatch, a video game and the Flacc Behavioral Pain Assessment Scale. Tolerance to discomfort was tested during the control by placing the volunteer's right foot toes in ice water set to 35°F and seeing how long they would be able to withstand the pain and at what level they experienced pain (based on the Flacc Behavioral Pain Assessment Scale). During the experimental, the volunteers were asked to start a video game and after five minutes of play, they were asked to place their left foot toes into the ice water and measured tolerance time and level.</p><b>Results</b><p>All the participants showed increased tolerance time from their control to experiment trials, and decreased discomfort levels from the control to experiment trials.</p><b>Conclusions/Discussion</b><p>Through the study, my hypothesis was proven to be true. The results illustrated a correlation between playing video games and tolerance. In fact, during each video game play, there was an observed increase in tolerance time and decrease in discomfort levels among the participants relative to their control trials. With gaming increasing, there seems to be a growing concern of individuals becoming heavily immersed in the technology that it has caused a desensitization and dismissal of instinctual behavioral responses. This leaves the question of in what ways mental distractions have affected humans throughout history. Are these disturbances so strong that they can cause negative consequences for those involved?</p></div>	
<b>Summary Statement</b> An Analysis of Discomfort Tolerance During Video Game Play	
<b>Help Received</b>	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ajay D. Khanna</b>	<b>Project Number</b> <b>J0412</b>
<b>Project Title</b> <b>Which Ages Best Understand Emojis?</b>	
<div><div><b>Objectives/Goals</b> The objective of my project is to determine which ages best understand emojis.</div><div><b>Methods/Materials</b> Ten subjects from each of the age groups tested were asked about their exposure to emojis. Each subject was then shown a sample sentence composed solely of emojis and given the correct interpretation. Then each subject was tested on their ability to interpret four different sentences composed of emojis.</div><div><b>Results</b> The average correct emoji sentence interpretation score in the 18+ age group, 11 to 14 age group, 8 to 10 age group, and 5 to 7 age group are 82.5%, 80%, 57.5%, and 45% respectively. All age groups were exposed to emojis with the exception of the 5 to 7 age group where only 5 subjects had previous exposure. 100% of the 18+ age group and 11 to 14 age group had used emojis themselves, whereas only 40% of the 8 to 10 age group and none of the 5 to 7 age group had used emojis.</div><div><b>Conclusions/Discussion</b> Emojis are becoming a commonly used form of communication today with the increased use of electronic messaging. In this study, subjects ages 11 and up on average scored above 80% in correctly interpreting emoji sentences. I found that the more exposure an individual had to emojis, including using emojis themselves, the more likely they were to correctly interpret them. Subjects in the older age groups were better able to understand emojis likely due to their exposure to smart devices and computers. Hopefully, the understanding of emojis will one day improve communication among all ages and people with disabilities.</div></div>	
<b>Summary Statement</b> The goal of my project is to see which ages best understand emojis.	
<b>Help Received</b> Mother helped correct grammar and sentence structure.	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Brendan Khoury</b>	<b>Project Number</b> <b>J0413</b>
<b>Project Title</b> <b>Think Away: How Does Your Thinking Style Affect Your Ability to Simulate the Future?</b>	
<div><div><b>Objectives/Goals</b> My project was to determine which thinking style (Divergent (a more creative thinking style that sees many possibilities) or Convergent (a thinking style that focuses mainly on knowledge and mathematical based thinking (usually sees only the most obvious possibilities))) is better at simulating the future in the mind. I believe that the Divergent will be better at simulating the future because the Divergent can calculate more options.</div><div><b>Methods/Materials</b> Select 10 or more people (has to be even)(two people per game, approximately the same age, and never played Abalone before), one copy of Abalone game, one copy of the Uses of Objects Test (a test that determines your thinking style), instructions for Abalone (it can be a video). I had the subjects do the Uses of Objects Test to determine their thinking style. Then I paired the subjects up Convergent with Divergent, read off the rules of Abalone, and had them play until someone won 2 out of 3 games. I used the outcome of the games to determine which thinking style is better at thinking ahead.</div><div><b>Results</b> The Divergent won 60% of the time, the Convergent won 20% of the time, and the 50/50s (a thinking style that is 40-60% of one thinking style and 40-60% of the other) won the other 20%. Also, the different thinking styles would win at different times. The Divergent would usually win the first game, lose the second and win the third. The Convergent, on the other hand, would usually lose the first game, win the second and lose the third.</div><div><b>Conclusions/Discussion</b> My conclusion is that the Divergent are better at simulating the future. Their ability to adapt and think their way around and through problems allowed them to better calculate future risk. Also, they were able to see multiple outcomes so they had better moves than the Convergent.</div></div>	
<b>Summary Statement</b> Which thinking style (Divergent (a more creative thinking style that sees many possibilities) or Convergent (a thinking style that focuses mainly on knowledge and mathematical based thinking)) is better at simulating the future in the mind?	
<b>Help Received</b> The guy at Marbles: the Brain Store helped me find the Abalone game, my mother helped me with funding, typing, and gluing.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Kylynn M. Leffingwell</b>	<b>Project Number</b> <b>J0414</b>
<b>Project Title</b> <b>The Power of Conformity</b>	
<div><div><b>Objectives/Goals</b> The purpose of my project was to determine if age or population size affects conformity. My goal was to help my subjects realize that they do base their opinions, thoughts, or actions on other people's opinions, thoughts, or actions.</div><div><b>Methods/Materials</b> The main material that is needed to experiment my project is a 10 question sheet of questions for pre-adolescent and adolescent subjects.</div><div><b>Results</b> My results were that age and population size affects conformity. The pre-adolescent stage conformed 30% more than the adolescent stage, and the groups of three conformed the most out of the groups of 3, 6, and 9.</div><div><b>Conclusions/Discussion</b> In conclusion my hypotheses 1, 2, 3, and 6 were correct. The hypotheses that were correct were the hypotheses that stated the groups of three would conform less and the groups of 9 would conform more.</div></div>	
<b>Summary Statement</b> My project is about finding the point at which people conform in certain times in their lives, and how they are influenced by their peers to do so.	
<b>Help Received</b> Professor Donnie Golden helped develop the idea for my project, mother helped design board.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Kirra A.L. McColl</b>	<b>Project Number</b> <b>J0415</b>
<b>Project Title</b> <b>A Tactile Approach to the Bouba Kiki Experiment</b>	
<b>Objectives/Goals</b> The bouba kiki effect is the psychological mapping of physical features with sounds. I chose this project after watching a dance performance and noticing how much the dancers' movements reflected the tone of the music. When the music was fast and sharp, the dancers' movements were abrupt and jerky. When the music was calm, the dancers' movements were fluid and smooth. This led me to think of the bouba kiki effect. The bouba kiki experiment was first conducted by German-American psychologist Wolfgang Kohler in 1929 and again by neuroscientist V.S. Ramachandran in 2001. In Ramachandran's test, subjects were shown two 2-dimensional drawings, one spiky and the other curvy, and were asked "In Martian language one of these shapes is called Bouba and one is called kiki. Which do you think is which?" 95% of subjects chose "bouba" as the round shape and "kiki" as the sharp shape. I wondered if the bouba kiki effect applied to the feel of 3-dimensional objects and would produce similar results.	
<b>Abstract</b> <b>Methods/Materials</b> For my experiment I constructed two 3-dimensional models out of Styrofoam, a spiky one representing "kiki" and a smooth one representing "bouba". I put the models in two different opaque bags, so the subjects could not see the shapes, and instructed test subjects to feel the shapes. I then asked them the same thing that was asked in Ramachandran's experiment: "In Martian language one of these shapes is called "bouba" and one is called "kiki". Which do you think is which?" I tested 90 students in total from the fifth through eighth grades at my school.	
<b>Results</b> Out of the 90 subjects I tested 81 of them made the bouba kiki association. With 92% of my subjects making the expected association, I had only a 3% difference from Ramachandran's experiment using 2-dimensional pictures.	
<b>Conclusions/Discussion</b> Based on the results of my experiment, the human brain is able to associate physical shapes and sounds, whether it be 2-dimensional or 3-dimensional. The bouba kiki experiment can yield similar results whether a person is viewing an image or touching a 3-dimensional object.	
<b>Summary Statement</b> My project tested the language association of physical shapes to sound when naming objects.	
<b>Help Received</b> My dad helped me cut the styrofoam for my models.	





# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Jackson Lee Moore</b>	<b>Project Number</b> <b>J0416</b>
<b>Project Title</b> <b>What Is the Relationship between Math, Music, and Emotion?</b>	
<div><div><b>Objectives/Goals</b> My hypothesis was that the mathematical frequency of a note played on a piano could be correlated to a specific emotion.</div><div><b>Methods/Materials</b> After obtaining informed consent I presented my test to my school mates, male and female, ages 11-12. During my experiment, I played a series of musical notes on the piano. The notes I selected were presented in somewhat random order to the listener during a video. All tones were played together as a pair of notes relatively close together but also across a wide range of frequencies - up and down the piano keyboard. The subjects then took two surveys, selecting the emotion they felt with each corresponding note.</div><div><b>Results</b> The data showed my test subjects seemed to equate happier emotions with higher frequencies and lower frequencies with sadder emotions. My general hypothesis about light and happy music (higher notes) vs. dark and dreary music (lower notes) seems to hold true.</div><div><b>Conclusions/Discussion</b> In conclusion, it appears that math, music and emotion are definitely intertwined in a complex relationship. As the number of musical melodies are infinite, the number of subtle emotional responses that can be felt from music is infinite as well.</div></div>	
<b>Summary Statement</b> The purpose of my project was to determine if there was a correlation between mathematical frequency of musical notes and certain emotions.	
<b>Help Received</b> My mom and dad helped me record the video and make a survey. My dad helped with the explanation of the mathematical analysis of the results and he helped with the graphic data.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Tria T. Nguyen</b>	<b>Project Number</b> <b>J0417</b>
<b>Project Title</b> <b>How Do Different Types of Music Affect Your Heart Rate?</b>	
<b>Objectives/Goals</b> The purpose of my project is to determine which genre of music will give a noticeable difference in heart rate. I will learn if the genre of music has an effect on a person's heart rate. From my investigation, I will have a better understanding of what the effects are of music on the heart. My goal is to see if music can help patients, students, or just about anyone.	
<b>Abstract</b> In my science fair project, I will be conducting an experiment on the human heart. I will use different genres of music and see which types slow down or speed up heart rate. First, I will get the average heart rate of all test subjects. Next, I will gather the five musically trained subjects and five musically untrained subjects; get them settled in on the couch with eye masks, and go to the quiet room where the experiment will take place. Then, the doctor or nurse will come to supervise. After each song is played, I will measure their heart rate and note the difference.	
<b>Methods/Materials</b> In my project, I found that classical music increased the heart rate of my musically trained test subjects. Whereas, my non-musical subjects had a draw between electronic and pop music as their increase. I believe that classical had an effect on the musical people because all of them played the piano and the classical song was played by a piano. For the non-musical people their genre is more common so they hear those songs more often. My conclusion is that the music the subject is more used to hearing is the one to increase their heart rate.	
<b>Results</b> After my experimentations, I've learned that #calming# music may help relieve stress but doesn't necessarily lower your heart rate. That is when it comes down to musically trained people. My research has taught me the effects of music that people never give mind to. I see science can be tied to anything. In conclusion, with my research all in all it depends on the subjects' background with music. It also relies on their opinion to music in general. This determines which songs they will get excited to and when their heart rate will go up or down.	
<b>Conclusions/Discussion</b> After my experimentations, I've learned that #calming# music may help relieve stress but doesn't necessarily lower your heart rate. That is when it comes down to musically trained people. My research has taught me the effects of music that people never give mind to. I see science can be tied to anything. In conclusion, with my research all in all it depends on the subjects' background with music. It also relies on their opinion to music in general. This determines which songs they will get excited to and when their heart rate will go up or down.	
<b>Summary Statement</b> My project's focus is to find out whether or not different genres of music can significantly affect your heart rate.	
<b>Help Received</b> Mom, Family friend who is a nurse to supervise the experiment with the subjects	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Andrew E. O'Rourke</b>	<b>Project Number</b> <b>J0418</b>
<b>Project Title</b> <b>ADHD vs. Non-ADHD Reaction Time</b>	
<div><div><b>Objectives/Goals</b> People diagnosed with Attention Deficit/Hyperactivity Disorder ("ADHD") tend to be more hyperactive than those who do not have ADHD. Unfortunately, ADHD is often thought of in a negative light. Rarely is the condition seen as a positive attribute, but studies show there are interesting advantages associated with ADHD. My goal was to test for and determine if people diagnosed ADHD has faster reaction times than those without this diagnosis.</div><div><b>Methods/Materials</b> I ran three tests, three times each on 5 ADHD and 5 non-ADHD subjects. Each volunteer was measured using a visual, an auditory, and a motor skills test so a broad range of different types of reactions could be measured and recorded  Materials Table; Chair; Ruler; Computer; Wi-Fi access; Access to website <a href="http://www.cognitivefun.net">www.cognitivefun.net</a>; Pen/pencil; Notebook; React-o-Meter (Measures hand-eye reaction time) made by Loncrain Broxton.</div><div><b>Results</b> My hypothesis was people diagnosed as having ADHD will have a faster reaction time than those without ADHD. I believed this to be true as many people with ADHD seem more hyperactive than the average person. I think that will translate over to reaction time.  After reviewing the data, my experiment is inconclusive and certainly did not support my hypothesis. Neither the ADHD or non-ADHD subjects showed a significant difference in reaction times. This was true across the board whether the reaction test given was visual, physical, or auditory.</div><div><b>Conclusions/Discussion</b> In thinking about the experiment further, the results may have been impacted by the fact my ADHD subjects could have been on prescribed medications to help with their condition. Presuming this is the case, these subjects were not able to go off their prescription just to aid in my testing. In two out of the three types of tests, the non-ADHD participants had a higher average score, but it was by a small margin and did not vary enough for me to state they clearly had better reaction times than those diagnosed with ADHD.</div></div>	
<b>Summary Statement</b> Testing to see if people diagnosed with ADHD has faster reaction times than those who aren't ADHD	
<b>Help Received</b> Kamau Norman-Terrence for helping me find test subjects for my experiments. Mr. Chris Donohoe for helping me with graphs and almost every technical aspect of my project. My father and mother for helping me proof read my papers and so much more.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Dominic K. Olson</b>	<b>Project Number</b> <b>J0419</b>
<b>Project Title</b> <b>Music Training: Does It Affect Listening Skills?</b>	
<div><div><b>Objectives/Goals</b><p>This experiment explored the relationship between music lessons and listening skills, particularly pitch perception. The hypotheses were: If a subject has had music training, such as piano lessons or school band, then they are more likely to have better pitch perception. If a subject has had music training before age 9, then they are more likely to have better pitch perception. Pitch perception is important beyond music listening. It is also an important part of understanding speech and relates to other communication skills including reading.</p></div><div><b>Abstract</b></div><div><b>Methods/Materials</b><p>The subjects were 121 seventh grade students. Each student answered questions about their musical background and then completed a 17-question listening test. In the test, participants heard recorded tones and answered questions about what they heard. There were four types of listening tasks, in increasing difficulty levels.</p></div><div><b>Results</b><p>The participants were sorted into four experience groups. The least experienced group had no music lessons and had not participated in school band or orchestra. The most experienced group were current music students and had started lessons before age 9. Higher levels of music training were statistically correlated to higher test scores on the listening test.</p></div><div><b>Conclusions/Discussion</b><p>Subjects that had music training scored higher, and subjects who started music lessons before age nine did the best. This study did not examine the cause of the correlation. Music lessons could cause someone to have better pitch perception, or people with good pitch perception may be more likely to continue lessons. To study this, the test could be used to evaluate how student performance changes over time.</p></div></div>	
<b>Summary Statement</b> <p>This experiment explored the relationship between music lessons and listening skills, particularly pitch perception.</p>	
<b>Help Received</b> <p>My science teacher allowed me to perform the experiment in her classes. My family served as test subjects when I was developing the test.</p>	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Michelle Qin</b>	<b>Project Number</b> <b>J0420</b>
<b>Project Title</b> <b>The Art of Praise</b>	
<div><b>Objectives/Goals</b><p>This project is concerned with the question of how to effectively praise students for good performance to make them better motivated, more confident, and more inclined to tackle challenges.</p></div> <div><b>Abstract</b><p>A series of experiments with a group of 60 subjects ranging from grade 6 to grade 10 was conducted on a one-to-one basis. Subjects were randomly assigned to three groups corresponding to neutral feedback, process praise, and person praise. The experiments were composed of a math problem-solving, puzzle-solving, recess (free choice), and self-attributions for failures period.</p></div> <div><b>Methods/Materials</b></div> <div><b>Results</b><p>With math problem-solving tasks, 96% of the process praise subjects preferred more difficult tasks upon successful completion of a task. In contrast, the person praise group had 39% and the group in neutral feedback had 46%. Similar results were found with puzzle-solving tasks: 92% for the process praise group, 33% for the person praise group, and 36% for the group in neutral feedback. For other dependent measures, the percentage of subjects who initially had difficulty in completing certain tasks but nonetheless kept trying was 62% for the process praise group, 10% for the person praise group, and 19% for the group in neutral feedback. At the end of the experiment, 75% of the process praise subjects had a growth mindset in relation to attributions for failures, 28% for person praise group, and 38% for the group in neutral feedback. The results are robust with respect to variations in task type and grade level. A particular unique finding revealed that post-success preference for harder tasks is uniformly stronger with math problems than with puzzles across all grade levels. This is a strong indication of the pursuit for a learning goal, because math problems offer better opportunities for increased learning than puzzles.</p></div> <div><b>Conclusions/Discussion</b><p>Subjects having preferences for more difficult tasks post success concentrated on the process of their work and opportunities for learning provided by more difficult tasks. That is, subjects with such preferences pursue learning goals instead of performance goals. As a result, this project shows that process praise is most effective, which is robust across grade levels and task types.</p></div>	
<b>Summary Statement</b> <p>My findings offer a support for the beliefs held by educators that praise for effort makes kids better motivated, more confident, and more inclined to tackle challenges.</p>	
<b>Help Received</b> <p>Mrs. Spracher at Monte Vista Elementary School generously supported and helped in obtaining permission, coordinating time, and arranging proper places for conducting the experiments; Professor Charness and Professor Vespa at UCSB offered helpful guidance during the early stage of this project.</p>	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Clarice E. Quigley</b>	<b>Project Number</b> <b>J0421</b>
<b>Project Title</b> <b>Does the Golden Ratio Affect Facial Beauty?</b>	
<div><div><b>Objectives/Goals</b> My objective is to determine whether or not people regularly find celebrity faces with proportions closest to the Golden Ratio to be most attractive. I believe that if I calculate the Golden Percentage (how close a face comes to the Golden Ratio) for celebrity face images and ask people to rate those faces for attractiveness on a scale from 1 to 10, people will rate faces with the highest Golden Percentage (GP) as most attractive.</div><div><b>Methods/Materials</b> 20 celebrity face images were obtained. A survey was created to rate perceived attractiveness of facial images. Informed consent was obtained from 35 randomly selected people. Each person was given the survey, results were recorded. Using survey results, an Average Attractiveness Rating (AAR) was calculated for each face and converted into percent form (10=100%). Celebrity face images, ruler, pencil, calculator and ratio formulas were used to calculate Facial Feature Ratios (FFR) for each face. Each FFR was converted into decimal form. Results were used to calculate an Average Facial Feature Ratio (AFFR) for each face. A Golden Percentage (GP) was calculated for each face by converting the AFFR to its percentage of the Golden Ratio (1.618=100%). This demonstrated how close each face's proportions came to the Golden Ratio. For each celebrity face image, the AAR and the GP were compared. The conversion of AAR and GP results into percent form made for a clear comparison. Results of this comparison were evaluated to determine whether or not people regularly found celebrity face images closest to the Golden Ratio to be most attractive.</div><div><b>Results</b> 6 out of 20 celebrity face images had a difference of 13.9% or less between their GP and their AAR. 14 out of 20 celebrity face images had a difference of 14.0% or greater between their GP and their AAR. Facial expressions, teeth, weight, coloring, makeup, hairstyle, apparent health and cleanliness, clothing, accessories, personality, humor, wealth and talents were factors in attractiveness ratings.</div><div><b>Conclusions/Discussion</b> The results of my science experiment did not support my hypothesis. Test subjects did not regularly rate faces with proportions closest to the Golden Ratio as most attractive. Factors beyond each faces GP influenced attractiveness ratings.</div></div>	
<b>Summary Statement</b> I have examined the effect of the Golden Ratio on test subject perception of facial attractiveness by comparing data from a survey rating facial attractiveness against data from analyzing facial proportions and the Golden Ratio.	
<b>Help Received</b> Parents helped me brainstorm possible topics and helped me to acquire the materials to construct my board; Grandparents provided use of their printer; Mother helped me record data while I gave survey to test subjects, helped edit writing and helped me work through difficult spots in my mathematical analysis.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Talia R. Raz</b>	<b>Project Number</b> <b>J0422</b>
<b>Project Title</b> <b>Confused Colors</b>	
<div><div><b>Objectives/Goals</b><p>The goal of my project was to see if scrambling the letters of the words in the tests would affect the speed and accuracy of the subjects scores on the Stroop Effect test. This test was also conducted to see whether or not scrambling the letters of the words in the tests would remove the conflict between the word and the color in the brain.</p></div><div><b>Abstract</b></div><div><b>Methods/Materials</b><p>97 permission slips were obtained from 97 subjects ranging in the ages of 5 through 13 and were varying from male to female. One desktop computer was used during all of the testing. A stopwatch was used to time subjects being tested. 97 checklists were used to check whether or not the subjects got the answer correct. Four different tests were used to test the subjects, a test with the color and word matching, another with the color and word not matching, a test with the color and word matching but the inside of the word was scrambled, and lastly a test where the color and word were not matching and the inside of the word was scrambled. All of the testing was done using Google power point.</p></div><div><b>Results</b><p>The results of my test showed that when you scramble the words in the Stroop Effect it confuses the brain more. Making the subject take more time to answer each question. The easiest and fastest test was as expected the test where the color and the word matched. When looking at the scores of the four different tests there was very little difference, they all scored around 14 to 15 words right. 15 words right was the maximum on all four of the tests. Looking at the age effecting the results, on three of the tests ages 12 -13 had the fastest times. However on the test where the colors and words did not match without scrambling the words ages 9 to 11 scored the fastest times.</p></div><div><b>Conclusions/Discussion</b><p>In conclusion scrambling the words in the Stroop Effect showed that it did not remove the conflict between the word and the color in the brain. It rather slowed down the subject, but had no affect on the scores the subjects produced. Removing the conflict between the word and the color in brain could be made by adding a background of the color the word. My hypothesis was proved wrong, and scrambling does not make subjects answer faster and more accurately.</p></div></div>	
<b>Summary Statement</b> <p>This test was conducted to see if scrambling the letters of the words in the Stroop Test would affect the speed and accuracy in the Stroop Test.</p>	
<b>Help Received</b> <p>Teacher helped correct papers on display board.</p>	





# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Joshua L. Richland</b>	<b>Project Number</b> <b>J0423</b>
<b>Project Title</b> <b>Flip or Treat: The Impact of Language on Risk Taking Behavior</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project was to see whether a person is more prone to take a risk in a foreign language or a native language. <b>Methods/Materials</b> The materials used consisted of an iPad, pencil, and paper. The subject would be asked, in their designated language, either Hebrew or English, if they want to flip the coin (on the iPad) to earn an additional marshmallow. If it lands on the side they chose, they receive an additional marshmallow. If it lands on the side that they didn't choose, they lose a marshmallow. If they chose not to flip the coin, they get to keep the marshmallow. Record the subject's decisions with the pencil on the paper. The data will be measured by the amount of times the subject wants to flip the coin. <b>Results</b> People turned out to be more prone to taking a risk in their native language. The average percentage of times the subjects were willing to flip the coin in their foreign language, was 51 percent, while it was slightly higher at 53 percent in their native language. The total percentage of times that people flipped the coin in Hebrew was 61 percent while the total percentage of times the subjects flipped the coin in English was 67 percent. In both Hebrew and English, the standard deviation was 7.07. <b>Conclusions/Discussion</b> The results of the experiment did not support the hypothesis, but what was learned is that there is not much of a difference between your willingness to flip a coin in a foreign language compared to a native language. When a seventh grader makes basic everyday types of decisions, they can trust that their preference will not be biased by the language a circumstance is presented in. In other words, should the seventh grader's understanding of the foreign language be sufficient enough to hold a simple conversation, they would make the same decision regardless of the language they were thinking in.	
<b>Summary Statement</b> This project tested whether someone is more prone to take a risk in a foreign language as opposed to their native language.	
<b>Help Received</b> My mother helped me make the board and edit documents. My father helped by buying all the materials needed. Mr. Hartung, my teacher, helped edit the documents and answer my countless questions.	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Sasha L. Ronaghi</b>	<b>Project Number</b> <b>J0424</b>
<b>Project Title</b> <b>Be Sun Smart</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this study is to determine the impact of education on the attitude towards sunscreen. Exploring this topic is extremely important because wearing sunscreen and being protected from the sun regularly is not a subject that comes to mind for the average person. However, it is important to question whether people are aware of the sun's harmful effects. Perhaps, educating people about the sun's harmful impact and sunscreen's benefits can affect their use of sunscreen. <b>Methods/Materials</b> In this project, regular 5th, 6th, and 7th graders are surveyed about their use of sunscreen and attitudes towards it. Then, they are educated about the sun. They watch three videos that pertain to the sun's harmful damages. In these videos, three different techniques are used to emphasize the importance of sunscreen. The subjects also perform a hands on experiment utilizing UV beads to determine whether or not their particular sunscreen brand protects them sufficiently from harmful UV Rays. A second survey is taken to measure their attitudes and behavior after education. Another group of 5th, 6th, 7th graders also take surveys, but do not get education. <b>Results</b> The manipulated and control subjects gave an average score of 6.45 and 6.32 on a scale of 1 to 10, respectively. However, after the manipulated subjects learned more about the usefulness of sunscreen, there was a small increase in their perception of importance of sunscreen, 7.29 vs. 6.45 (after vs before). For control subjects, their perception of the usefulness of sunscreen slightly declined, 6.06 vs 6.32 (after vs before). Interestingly, the younger group composed of fifth-graders thought that sunscreen was more important than their older schoolmates. <b>Conclusions/Discussion</b> Based on my results, there was a small positive impact on the knowledge about sunscreen, about the harmful effects of the sun and the usefulness of sunscreen. However, in practice, education did not translate into wearing sunscreen more often. On average, the manipulated subjects wore sunscreen 2.83 days, compared to the controlled subjects that wore sunscreen for 2.97 days. Therefore, while education has affected attitudes towards sunscreen, people are not wearing it. As for the video that was chosen as the most affecting towards decisions was "Melanoma Will Kill You". 67% subjects this video as the most impactful. Proving that with dramatic education some attitudes can be changed.	
<b>Summary Statement</b> This project determines the impact of education on attitudes towards sunscreen.	
<b>Help Received</b> Teachers gave me time with their students	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Manaal A. Sayed</b>	<b>Project Number</b> <b>J0425</b>
<b>Project Title</b> <b>Eating Disorders Comorbid with Depression: A Growing Problem among Teens</b>	
<b>Objectives/Goals</b> Eating disorders are a growing problem among teenagers and could possibly have a significant impact on their health. I became interested in this project because I constantly saw how one of my close friends was emotionally and physically affected by the symptoms of her eating disorder.  The purpose of this project is to find out if eating disorders are comorbid with depression among teenagers and what the main cause of eating disorders is.  My hypothesis is that eating disorders are comorbid with depression and higher stress levels are the main cause of eating disorders.	
<b>Abstract</b>  <b>Methods/Materials</b> After contacting 40 high schools in Los Angeles and Orange County, 487 teenagers between the ages of 13-18 participated in this study. The sample consisted of 60% females and 40% males. I designed my own anonymous survey that had screening questions for eating disorders, depression and possible causes for this condition. 4 practicing psychiatrists helped me finalize my survey. They also guided me on how to analyze and score the surveys using 2 alternate methods. Teachers at the participating high schools passed out the surveys during class time.	
<b>Results</b> 62% of the surveyed teenagers with eating disorders also experienced depression. The main cause of eating disorders was cultural factors, not stress. 80% of the surveyed teenagers who had an eating disorder were females. The surveys demonstrate that females are more sensitive to peer pressure than their male counterparts.	
<b>Conclusions/Discussion</b> There is a link between eating disorders and depression, but the main cause of an eating disorder is cultural factors, not higher stress levels. Some limitations to the project were that all possible causes of eating disorders were not included in my study. I hope that these types of screening questions could be included in regular health screening questions in high schools. Early detection may lead to early intervention and create a positive impact on the treatment of these disorders. Most research conducted by universities and health organizations on this topic has been on fewer than 200 participants. I hope to continue with this study, which started out to be a science project and has now become an intensive study beyond the science fair.	
<b>Summary Statement</b> This project attempts to determine the relationship between eating disorders and depression among teens and find its main cause.	
<b>Help Received</b> 4 practicing Psychiatrists helped finalize my surveys and gave guidelines on analyzing them; 487 participants and their teachers from various schools; and my parents helped me with the board and driving to the schools and psychiatrists.	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Emma R. Schaefer-Whittall</b>	<b>Project Number</b> <b>J0426</b>
<b>Project Title</b> <b>Is the Science Fair... Fair?</b>	
<b>Objectives/Goals</b> My project was to see if there is a gender bias in different levels of competition and age divisions at the science fair.	
<b>Abstract</b>	
<b>Methods/Materials</b> First, I contacted science fair coordinators to receive a list of participants and winners. I then went through the lists to identify the gender of each person based on their name. For the state science fair, I ran a PERL script to reformat the entries from the website to excel. I counted the number of male and female participants and the number of male and females that won awards. Next, I determined those percentages to compare the percentage of males and females between the participants and awardees.	
<b>Results</b> Overall, the average science fair has 57% female participants. Among the three age divisions, females had higher participation. It was most different in elementary schools (40% male, 60% female) compared to middle schools (47% male, 53% female) and high schools (45% male, 55% female). Among the three levels of fairs, females had higher participation than males at school fairs (39% male, 61% female) and county fairs (46% male, 54% female). At the state level, male and female participants were 50:50. Of the 35 fairs studied, 23 had male winners overrepresented by an average of 2.4%. Among the three age divisions, 8 out of 10 elementary school fairs, male winners were overrepresented. In 9 out of 16 middle school fairs, males were overrepresented. In 6 out of 9 high school fairs, males were overrepresented. At the school level, male winners were overrepresented in 12 out of 19 fairs by an average of 3.6%. At the county level, the number of fairs with males overrepresented was equal to the number of fairs with females overrepresented. At the state level, 7 out of 8 fairs had male winners overrepresented.	
<b>Conclusions/Discussion</b> My studies show that girls ARE interested in math and science because their participation is higher than males. Yet, at the highest level of competition males were overrepresented as award winners in 7 out of 8 state science fairs. This supports my hypothesis that the overrepresentation of males will increase as students' progress to higher levels of competition. I believe that the reason for the male bias among winners is that females are not being "encouraged" (award winners) as much as they should be.	
<b>Summary Statement</b> The importance of my project is to see if there is a gender bias in different age divisions and competition levels of the science fair.	
<b>Help Received</b> Joyce Masongsong-Rey, Justen Whittall, Sally Ghilarducci, Chris Nestlerode, and Craig Laughton provided me with their science fair data	



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> <b>Rachel A. Sragovicz</b>	<b>Project Number</b> <b>J0427</b>
<b>Project Title</b> <b>If You Give a Kid an iPad</b>	
<div><div><b>Objectives/Goals</b> The purpose of this experiment was to determine the effect of technology in early childhood education. The focus of this experiment was to evaluate if the amount of technology a child uses at home affects how they learn.</div><div><b>Abstract</b> Methods: Test 75 children between the ages of two and four. Divide them into groups based on technology usage at home. Each child is given one electronic test and one verbal test. In the electronic test the children were asked 5 questions using an app called EduPaint on a mini iPad. The verbal test consisted of five questions and asked similar questions to those of the electronic test, but the questions were verbally asked by the tester. Materials needed: Electronic products where the app is available, 5 question verbal test worksheet based on child's age.</div><div><b>Methods/Materials</b> Results There was no correlation found between the technology group's results. However, the 2 year olds had the highest overall average and the 4 year olds had the lowest. The four year olds also had the highest range of electronic and verbal results, which were 59 and 73, respectively.</div><div><b>Conclusions/Discussion</b> The results of the experiment did not support the hypothesis. The test scores did not show any relation between technology usage at home and test scores. The data showed that at a young age there is no direct correlation of amount of technology used at home and the effect it has on the test scores. However, the majority of the children scored higher on the verbal test.</div></div>	
<b>Summary Statement</b> This project tested if the amount of technology a child ages 2-4 uses on a daily basis at home affects how they learn at school.	
<b>Help Received</b> Mrs. Gillum, my teacher, my mom and mentor Marina Sragovicz, father Adam Sragovicz and sister Shayna Sragovicz.	



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Zoe Le Thomas</b>	<b>Project Number</b> <b>J0428</b>
<b>Project Title</b> <b>To Wear or Not to Wear</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Students and children today are creating cliques and deciding who their friends are based on what they themselves or others wear. The goal of this project was to discover how students' opinions and negative stereotypes on clothing change along with students ages and grades. <b>Methods/Materials</b> The students were shown categorized pictures of clothing and had to respond according to symbols and letters for their answers. Younger students, grades Kindergarten to Fourth, were given picture books with the pictures for them to either cross out the picture if they do not like the clothing and don't like other people wearing it, circle it if they do like the clothing and like other people wearing it, or leave it alone if they don't have an opinion. The older students, grades Fifth to Eighth, were shown the same photos on a powerpoint and then responded with letters. A meant they enjoyed that clothing and would wear it all the time, B meant they liked that clothing but would only wear it during certain occasions, C meaning they liked the clothing but wouldn't wear it, and D meaning they do not like it at all and wouldn't wear it and did not like others wearing it. <b>Results</b> The students from all of the different grades seemed to have the same results. Their percentage numbers, or the percent chance that a student would select a specific answer, were all very close to each other. In all the grades, the dislike percentages were below 50%. <b>Conclusions/Discussion</b> This experiment shows how grade may not be what effects different opinions and negative discrimination with students under the ninth grade.	
<b>Summary Statement</b> To see how grade affects negative opinions and discrimination on certain styles of clothing.	
<b>Help Received</b> Mrs. Elaine Gillum; tested students at Marshall Middle School and Innovations Academy	



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Mihai C. Tudor</b>	<b>Project Number</b> <b>J0429</b>
<b>Project Title</b> <b>The Unseen Labyrinth</b>	
<div><div><b>Objectives/Goals</b> The goal of this project is to see if it is possible to create a video game for blind people and if they will get the same amount of entertainment from the game as people who can see. I was also trying to see what the difference was between people who could see and people with blindfolds, and therefore find out how much we actually rely on sight.</div><div><b>Methods/Materials</b> In this project, I used Scratch 2 Offline Editor (a program that allows beginning programmers to make easy and fun games using base ideas from Java), on an Acer brand laptop.</div><div><b>Results</b> The participants that were blindfolded in my project all managed to complete my game in under 16 minutes, with varying degrees of difficulty, and with times ranging from six minutes and forty-five seconds to fifteen minutes and twenty-six seconds. The average time to finish the game was eleven minutes and seventeen seconds. Eight people tested the game, and four people also played the game without blindfolds, three of which had also played it with blindfolds. Their average time was three minutes and fifty seconds.</div><div><b>Conclusions/Discussion</b> In general, I believe my project was a success because it shows that you can easily make a game that is very fun to play without sight. However, the results of the blindfolded testers compared to people who can see, show that blind people will most likely progress slower than people who can see because they have to rely on sounds to discover the maze while those who can see can avoid the walls instead of running into them.</div></div>	
<b>Summary Statement</b> I used Scratch 2 Offline Editor to program a simple maze game that played a sound every time the player hit a wall and another sound when they completed a level, with 18 total levels, and I had a number of people play the game while recordi	
<b>Help Received</b> I received help from my mother with the project abstract, and my friends and family all helped by testing the game for me and letting me record their playthroughs.	





# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Rhitishah Yuva Raju</b>	<b>Project Number</b> <b>J0430</b>
<b>Project Title</b> <b>Illuminate Your Life with Light and Color</b>	
<b>Objectives/Goals</b> My objective was to learn if there is right light and wall paint in a room; then, the mood will improve to create better lifestyle for a person, because wall paint and light determines and sets the mood of a person in the house (different rooms in the house).	
<b>Abstract</b> <b>Methods/Materials</b> Materials used: Lights with 2700 and 5000 Kelvin (CFL-Compact Florescent Light & LED-Light Emitted Diode), 5 different Wall Paint colors (Blue, Green, Red, White and Yellow) with Light Reflective Value (LRV) of 65-75. Five different wall paint colors hand-painted tri-folds. Methods: 1st Survey: talking to experts (Engineers, Doctors, Psychology and Social Worker)-pool of 10 people to find out having right wall paint and light will help set correct mood. Spoke to doctors on how brain works toward mood. 2nd Survey: conducted 100 people with variety of age range survey to find out preferred mood in 5 different areas in the house: Kitchen-alert, study room-focus, bedroom-relaxed, dining room-relaxed and living room-lively. Finally, conducted experiment with 20 people; each person placed in 5 different wall paints, 2 different lights and Kelvin - an hour each person. Entered all survey data in spreadsheet, bar chart and pie chart to analyze and conclude.	
<b>Results</b> From the surveys and experiment data, I have drawn spreadsheets, bar charts and pie charts to analyze and conclude. Below is the final findings/result of preferred mood by areas in the house and what are the wall paint and light that can help to achieve this preferred mood: Areas Mood Paint Light Kelvin Kitchen Alert Yellow LED 5000 Study Room Focused Green CFL 5000 Bedroom Relaxed Blue CFL 5000 Dining Room Relaxed Blue CFL 5000 Living Room Lively Blue CFL 5000	
<b>Conclusions/Discussion</b> My hypothesis was proven to be true. A person's mood is affected by the environment (wall paint and light) surroundings. Thus, the best light and wall paint in different areas of house does help create better lifestyle for a person. In the kitchen people want to be alert, Yellow wall paint with LED light preferred. Study room is where people want to be focused with green wall paint. Where else in bedroom and dining room people prefer to be relaxed with blue wall paint. Living room, where people want to be lively with	
<b>Summary Statement</b> The lights (CFL and LED) with right kelvin and different wall paints in different rooms can improve quality of life and set preferred mood in the house.	
<b>Help Received</b> Parents supervised while using electrical outlet and switching lights.	