



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

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| <b>Name(s)</b><br>Satya S. Karri   | <b>Project Number</b><br><br>34009 |
| <b>Project Title</b><br>Can People Identify Numbers Greater than Three?  |                                    |
| <b>Objectives/Goals</b><br>The goal is to determine if people can actually estimate and identify numbers greater than 3. According to a study done in Nicaragua, people can determine numbers up to 3, but they have difficulty when presented with numbers greater than 3. I hypothesized that humans could only accurately determine numbers up to 3.<br><b>Abstract</b><br><b>Methods/Materials</b><br>Prior to actual testing, the subject had to pass two control tests. The first test had the subject read some words on the screen; this was used to determine if the subject could distinguish black from white. The second test had the subject count to 15; this was used to determine the subject's knowledge of numbers up to 15. Then, I used a PowerPoint presentation to present the set quantities of objects, which were simply dots on a screen. The dots flashed on the screen for exactly 0.5 seconds by applying a timer on the appropriate slides. There were 15 slides of dots total and the order was determined using a random number generator. Each correct answer was recorded as well as each incorrect answer. I tested 3 age groups: less than thirteen-years-old, thirteen to twenty-one-years-old, and greater than twenty-one-years-old.<br><b>Results</b><br>All subjects could correctly estimate numbers up to 4 dots. Subjects then began to make a few mistakes at 5 dots. Once there were 9 dots, however, there was a massive drop in correct answers. Past 9 dots, there continued to be a lack of correct answers. Subjects less than thirteen-years-old were made mistakes than those who were older.<br><b>Conclusions/Discussion</b><br>Since all subjects correctly estimated the number of dots up to 4, people must be able to identify numbers up to 4. Since a few incorrect answers were given starting at 5 dots, it is reasonable to say that humans still have a good grasp on this set of numbers. However, at 9 dots and onward, most people have difficulty with estimation. Therefore, my hypothesis was slightly incorrect; humans can identify numbers greater than 3. |                                    |
| <b>Summary Statement</b><br>I tested to see how accurately a person could estimate a quantities greater than 3.  |                                    |
| <b>Help Received</b><br>I received help from Dr. Joseph Immel, who helped me choose an idea and procedure. I also received help from Eddie Ortiz. He helped me conduct some tests; he helped me transition through the PowerPoint so that I could test with greater efficiency.  |                                    |