



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Michael J. Endick	Project Number S0308
Project Title Is Your View Askew?	
Objectives/Goals The project was designed to test for (and possibly establish) a hypothetical correlation between rotational orientation of a pie graph and the ability to make an accurate estimate of a constant wedge.	
Abstract Methods/Materials 24 pie graphs were created using twelve sets of constant values, 12 graphs with the starting line aligned with the vertical axis, and 12 graphs with a starting line rotated from that axis. The constant values tested for were the same between the rotated and non-rotated counterpart, but the remaining two values used to make the rest of the pie graph were randomized to ensure no two graphs were the same except for rotation. 20 subjects, 10 from each gender and with a wide age spread, were asked to participate by estimating the constant value.	
Results Values were collected for each entrants individual errors, as absolute values above or below the actual values for each graph, and outliers were removed. These errors were then calculated as an arithmetic mean for each of the 24 graphs, using the results from all 20 participants. When comparing the overall error, nine out of twelve of the constant values had a higher average error when placed in a rotated graph versus a non-rotated graph, supporting the hypothetical correlation between rotation and ease of estimation.	
Conclusions/Discussion The data suggests a correlation between rotation of a graph and its ease of estimation. What can be determined from this is a subconscious preference for an aligned pie graph when attempting to estimate the value of a wedge, regardless of numerical representation. A possible use for these findings may be a method of disorienting consumers viewing the pie graph of a sensitive subject by attempting to make the exact size of a wedge harder to determine.	
Summary Statement I wanted to determine if there was a correlation between the rotation of a pie graph and an average person's understanding of the pie graph itself.	
Help Received Father helped set up Data Collection Table and format score sheets, also helped tabulate data and put into spreadsheets. Both parents helped with layout of final display.	