



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

<b>Name(s)</b> <b>Kinsey L. Purcell</b>	<b>Project Number</b> <b>J0716</b>
<b>Project Title</b> <b>The Mystery Box</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this study is to determine which gender can best identify the 3-dimensional mystery shape inside a masked box the most accurately. I hypothesized that males would tend to do better than females because of previous research indicating that males of this age scored higher on 3-dimensional puzzles as well spatial orientation and mathematical problems.</p> <p><b>Methods/Materials</b> General Materials: 1)Board for science fair (standard foam), 2)Binder (7.5 cm), 3)Plastic sheets, 4)Pencil (#2), 5)Paper (lined, and white), 6)Science fair notebook, 7)Computer, 8)Printer, 9)Microsoft Office and Excel, 10)Sharpies, 11)Eraser 12)Glue/adhesive, 13)Flash Drive, 14)Research material (neuroscience). Testing Materials: 1)4 boxes (card board,lid,15 x 5, 2)4 hollow 3D shapes; heart, circle, triangle, &amp; trapezoid (depth is 4.5 cm, 12cm x 10 cm).</p> <p><b>Results</b> This study examined the ability of males compared to females to determine the identity of a complex 3-dimensional shape hidden in a mystery box. Forty 8th graders were examined. The results showed that when given a heart shaped puzzle, that females accurately identified the shape 40% of the time and males scored an accuracy of 50%. When given the circle shape puzzle, the females to males were 70% vs 55%, When given the triangle shaped puzzle, the females to males accuracy was 45% vs 80%, and the trapezoid identification accuracy for females to males was 50% vs 50% , respectively. It was also noted that males were more accurate at identifying shapes that did not contain sharp edges. With regards to the overall identification, it was found that females were on average accurate 51% of the time and males were accurate 60% of the time.</p> <p><b>Conclusions/Discussion</b> This experiment revealed that on average 8th grade male test subjects were able to more accurately identify a complex three-dimensional mystery shape hidden in a plain cardboard box than 8th grade female test subjects. Males scored an accuracy of 60% compared to the females accuracy of 51% when the data was collected on mulitple choice questionnaire. During the early design of this experiment, the test subjects were not given a multiple choice questionnaire and resulted in extremely poor accuracy in mystery shape identification. Therefore, it was decided to provide the test subject with a multiple choice questionnaire for more accurate percentage of correct answers.</p>	
<b>Summary Statement</b> This project is about the difference between genders in 3-dimensional spatial problem solving skills.	
<b>Help Received</b> Father helped me research the background information on the brain. Mother helped assist with some minor typing and editing.	