



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Supriya A. Bhupathy</b>   | <b>Project Number</b><br><b>S0403</b> |
| <b>Project Title</b><br><b>Scents and Sensibility: Do Classroom Scents Improve Academic Performance?</b>   |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>The objective of this study was to determine whether placing scents (citrus, rosemary, or sandalwood) in classrooms could improve student performance on mathematical (left-brain) and pattern (right-brain) based tests, and possible gender differences.</p> <p><b>Methods/Materials</b><br/>Materials used in this project included student Tests 1 and 2, reed diffusers with citrus, rosemary, or sandalwood scents, and the excel program and online calculators for statistical analysis. A total of 162 tests were administered to 4th and 5th grade students. Test 1 was administered to four classrooms. Then, reed diffusers were placed in three classrooms, and one class served as a control. After a week, all four classrooms completed Test 2. Data was gathered, tabulated and statistical analyses performed. A second rosemary trial was then performed.</p> <p><b>Results</b><br/>All four groups improved in their mean score from Test 1 to Test 2; however, paired t-test showed no significant improvement for citrus (p-value 0.2549), sandalwood (p-value 0.1237) and the control (p-value 0.1028). Rosemary showed almost significant improvement (p-value 0.0676). Therefore, a second trial was conducted, which showed a significant improvement (p-value of 0.0065). The data was further divided into left-brain and right-brain sections and males and females on which further statistical analyses were performed.</p> <p><b>Conclusions/Discussion</b><br/>This study showed that there was a significant improvement in test performance when rosemary scent was disseminated in classrooms as expected in the hypothesis. However, it was not possible to draw conclusions between left brain and right brain functions; additional analysis revealed possible inequality between the tests. Males improved in their test performance with the rosemary scent, which is different than hypothesized. To improve this study, Test 1 and Test 2 should be revised in a control group first to insure equal difficulty, and then the study should be repeated with multiple trials for each scent.</p> |                                       |
| <b>Summary Statement</b><br>This study attempted to show that scents in the classroom could improve test-taking performance, which could then be extrapolated to other environments to improve productivity at home, school, or work.  |                                       |
| <b>Help Received</b><br>My parents helped me by obtaining materials and reviewing my paper and poster. They also drove me to and from the schools.   |                                       |