



# CALIFORNIA STATE SCIENCE FAIR

## 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Julian R. McLeod</b>	<b>Project Number</b> <b>J1218</b>
<b>Project Title</b> <b>The Power of a Deep Breath</b>	
<b>Objectives/Goals</b> The objective of my project is to determine if deep breathing can effect blood pressure, temperature and pulse and therefore help reduce the physiological effects of stress. I believe that subjects under stress using deep breathing techniques will have a lower blood pressure, temperature , pulse and a calmer feeling compared to those who use no breathing techniques.	
<b>Abstract</b> <b>Methods/Materials</b> Informed consent was obtained from 20 randomly chosen students from Pacific Union Elementary school, between the ages of 13 and 14. To stimulate stress in the subjects during the test, I created a card game memory test with the incentive of a candy reward achieved by completing the test quickly. I separated the students into two groups. Each group with an equal amount of girls and boys. Test group A would be sitting for two minutes in silence before the test therefore giving their body time to react to fight or flight response. Group B would be taught abdominal breathing and breathing visualization to use before and during the test. I took their blood pressure, temperature, and pulse three times throughout the study. I gathered a baseline when they first came in. Then gathered two other readings to compare and analyze. I also questioned the students obtaining their comfort level. I converted my blood pressure readings into mean arterial pressure. Mean arterial pressure or MAP is the average pressure in arteries during one cardiac cycle, it is found by using a calculation using the BP. It is considered a better indicator of perfusion to vital organs than systolic blood pressure. Then created a group average and individual average for each subject.	
<b>Results</b> I found deep breathing did have an effect. Those using deep breathing in Group B had a lower group average MAP of 82 mmHg and lower pulse. Group A had a higher group average MAP of 88 mmHg and higher pulse. This shows that with deep breathing there was a decrease in MAP and pulse and without deep breathing the students fight or flight response activated. There was no significant fluxuation in temperature for either test groups. Fifty percent of the students using deep breathing physically reported to feel more comfortable.	
<b>Conclusions/Discussion</b> My conclusion is with deep breathing students were able to obtain a calmer physiological and psychological state proven by lower MAP and pulse, and reported feelings. My objective was proven and my hypothesis was correct.	
<b>Summary Statement</b> Can deep breathing reduce the pysiological and psychological effects of stress?	
<b>Help Received</b> My Mom taught me how to take students BP, pulse and temperature. She bought an electric BP cuff for the project. My science teacher Mr. Lane helped facilitate my experiment at school.	