



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kirk Patrick H. Testa</b>	<b>Project Number</b> <b>J0426</b>
<b>Project Title</b> <b>Lights On! Lights Off! Testing the Amount of Light vs. the Feeling of Sleepiness</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine certain amount of lights' role in melatonin production and a person's feeling of sleepiness and ability to focus in a classroom environment. If the amount of light in a classroom affects the feeling of sleepiness in middle school students, then the reduction of light will increase melatonin production, therefore increasing the feeling of sleepiness by 10%, because melatonin, a hormone produced in the pineal gland and retinas induce sleepiness; studies have shown that adolescents lack the required amount of sleep, making them prone to sleeping in class; and the season in which the experiment is conducted (winter) has proven to be a time in which melatonin is secreted in higher doses than regular.</p> <p><b>Methods/Materials</b> 200 middle school test subjects were to watch a "Bill-Nye" movie (sound output-63.4 dB) in a classroom environment (fluorescent lighting, desks, blacked out windows and room temp. 20-21°C) with a certain amount of light per day (3 days during winter). Day 1-no light, 5 lux (independent variable 1/control); Day 2-1 series of light/half amount, 38 lux (independent variable 2); Day 3-2 series of lights/full amount, 72 lux (independent variable 3). Test subjects were to fill out a survey questionnaire sheet before and after watching the movie.</p> <p><b>Results</b> Day 1 (5 lux) caused the greatest average percentage increase of the feeling sleepiness (41.30%). Day 2 (38 lux) caused an average 35% increase of feeling of sleepiness. Day 3 (72 lux) caused an average 30.57% increase of feeling of sleepiness. This determined the light measurements 5, 38, and 72 luxs' role and effect on the feeling of sleepiness.</p> <p><b>Conclusions/Discussion</b> The hypothesis was valid because the results were much higher than the predicted 10% average increase of the feeling of sleepiness between before viewing the movie from after viewing the movie. Other factors that may have played a role in proving the hypothesis correct may have been the weather, caffeine and breakfast intake, and gender. This experiment is scientifically important because it may help teachers and educators determine and create learning environments that best suits their students to not arouse sleep. Also, the results of this experiment may be useful information for workplace knowledge, because many jobs involve working at night and knowledge of how light effects performance can be a factor in the safety of workers.</p>	
<b>Summary Statement</b> The project focuses on the the effects of melatonin on the feeling of sleepiness of middle school students in certain amounts of light.	
<b>Help Received</b> 7th & 8th grade teachers Mr. Ballard and Ms. de Wood mentored and assisted me with the project; Dr. Hurst provided personal input and knowledge as research.	