



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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<b>Project Title</b> The Effect of Seasonal Changes on the Luminescent Time Spans of Dinoflagellates	
<b>Objectives/Goals</b> 1. Do seasonal changes affect dinoflagellates? How would recreating the events leading up to the winter solstice (during which the days become shorter) affect all dinoflagellates living anywhere except the equator (where the days and nights are 12 hours long all year round)? 2. How would altering the dinoflagellates 12 hour day/night cycle affect them? How would subtracting an hour from the dinoflagellate cycle per day, until they were left with 6 or 8 hours (instead of the regular 12) to photosynthesize, affect the dinoflagellates luminescent time span? <b>Abstract</b> <b>Methods/Materials</b> For Experiment 1, 3 cultures of dinoflagellates were tested at different times during their night cycle. Group 1 was on a 12/12 (day hours/night hours) cycle, Group 2 was on an 8/16 cycle, Group 3 was on a 6/18 cycle. Experiment 2 consisted of 3 Groups each containing 3 cultures (designed to strengthen data from Experiment 1). These were also tested at 12/12, 8/16, and 6/18 light exposure cycles. The cultures were tested 2 hours into the dark cycle and how long they luminesced was determined when stimulated by movement. <b>Results</b> The control group (Group 1) of dinoflagellates, on the 12 hour cycle, luminesced for an overall average of 71 seconds. The 8/16 hour (Group 2) luminesced for an overall average of 46 seconds. This group declined 20 seconds, then evened out and luminesced at around 45 seconds. The 6/18 hour (Group 3) luminesced for an overall average of 27 seconds; the entire Group died. <b>Conclusions/Discussion</b> By altering the dinoflagellate groups' 12 hour cycle, a decline in their luminescent time span resulted and all 3 cultures in Group 3 died. Experiments 1 and 2 proved that dinoflagellates are affected by seasonal changes. I have learned that dinoflagellates are strictly dependent on their 12 hour cycle. This is clear because the 6/18 group died after 17 days.	
<b>Summary Statement</b> The dinoflagellates require 12 hours to photosynthesize in order to remain healthy and luminesce when stimulated.	
<b>Help Received</b>	