



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Codi L. Hirsch</b>	<b>Project Number</b> <b>S2009</b>
<b>Project Title</b> <b>Natural v. Artificial: Photosynthetic Comparisons on Multiple Plant Species</b>	
<b>Objectives/Goals</b> My goal was to discover the effects of artificial v. natural sunlight on the photosynthetic rates of a fruit, a vegetable, a flower, and a succulent in closed, controlled ecosystems.	
<b>Abstract</b>	
<b>Methods/Materials</b> 12 each one-gallon plastic containers, super soil, water, 3 equally sized: strawberry rootings, potato eyes, daffodil bulbs, and mini jade rootings; 12 each 1/2" PVC ball valves, 12 each 1/2" PVC male adapters with nuts, a rectangular insulated enclosure that is 28 in. x 28 in. x 36 in. with a removable door, 450 LED blue and red light assembly, a temperature sensor, Vernier Logger Pro 3 downloadable software, Vernier carbon dioxide gas sensor, Vernier Oxygen gas sensor.	
<b>Results</b> Natural light was more beneficial to the plants than the artificial light.	
<b>Conclusions/Discussion</b> Natural sunlight is more efficient in aiding the process of photosynthesis than artificial light. Strawberry plants had the fastest photosynthetic rates, followed by the potatoes, the daffodils, and then the succulents. This I believe was due to the plants' size and mass, number of leaves, and state of health. I was surprised to see that the levels of carbon dioxide were relatively high in the exosystems. I believe this could be because of the container's size and the ratio of water, soil, and plant size in the environment. There was a relative movement between the differences in the two gases, which allowed me to make an approximate conclusion.	
<b>Summary Statement</b> My project is about the effects of artificial and natural sunlight on the photosynthetic rates of various plants in controlled ecosystems.	
<b>Help Received</b> Father helped build the controlled ecosystems	