



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Daniel J. Ridgway</b>   | <b>Project Number</b><br><b>J0926</b> |
| <b>Project Title</b><br><b>Environmental Factors Affecting Transpiration / To Transpire or Not to Transpire: That Is the Question</b>  |                                       |
| <b>Objectives/Goals</b><br>The objective of my project was to determine which environmental variable would cause the greatest transpiration in snapdragon plants. Based upon my research, I hypothesized that the plants subjected to "heat and wind" would show the greatest transpiration.   |                                       |
| <b>Abstract</b><br><b>Methods/Materials</b><br>Six different groups, containing three single snapdragon plants in individual containers, were established. Groups were designated: 1) control, 2) heat, 3) water, 4) heat and wind, 5) dark, and 6) Next Step's petroleum coated. Each test group, excluding control, was given 20ml water. Each plant base, excluding control, was wrapped with a plastic baggie and tied off to prevent evaporation of water from the soil. Plants were weighed using a triple beam balance. The weight of each plant was recorded in grams. Each group was then subjected to its designated environmental variable (condition). Every individual plant was weighed every hour for a period of eight hours. Loss of mass through transpiration was recorded. Data was analyzed. Graphs were created representing transpiration of each individual plant and averages of like plants within a variable group.   |                                       |
| <b>Results</b><br>Plants subjected to "heat" showed the most transpiration. In addition, the petroleum coated "Next Step" group should have shown little evidence of transpiration, according to my research; however, the "petroleum coated" plants transpired more than the "heat and wind" group, the "dark" group, and the "water" group.  |                                       |
| <b>Conclusions/Discussion</b><br>My results did enable me to determine which environmental variable caused the greatest transpiration. My original hypothesis was incorrect. The "heat" group of plants showed greater transpiration than the "heat and wind" group. Surprisingly, the hypothesis for my "Next Step" was also incorrect. According to my research, the "petroleum coated" plants should have shown little evidence of transpiration; however, the "petroleum coated" group transpired more than the "heat and wind" group, the "dark" group, and the "water" group.<br>My findings suggest that gardeners and landscapers should know how the transpiration of plants is affected by various environmental conditions before planting any plant in a garden or landscape setting. Water, a valuable resource in California, could also be better conserved if a transpiration index was developed. Garden and landscaping plants could then be labeled for various geographic areas in California and across our nation. |                                       |
| <b>Summary Statement</b><br>Snapdragon plants were subjected to different environmental conditions to determine which variable caused the greatest transpiration; therefore, I could determine if snapdragons were environmentally suited for my back yard garden.   |                                       |
| <b>Help Received</b><br>Mom typed my project, took pictures, and had film developed. Dad borrowed the triple beam scale from his high school. My project was critiqued by Mrs. Nelson, my teacher, and Mr. Bline, Dean of Students.  |                                       |