



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jonathan B. Beckman</b>	<b>Project Number</b> <b>J1603</b>
<b>Project Title</b> <b>Stomata Junction: What's Your Function?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The project purpose was to determine whether the number of stomata on a leaf's surface affects volume of water transpired in 24 hours. After testing environmental effects on stomata distribution, I explored the actual transpiration of water vapor through a plant's leaves. I had to determine the number of stomata on the leaves of two plants from three different growing environments: full sunlight, partial sunlight, and full shade. I then measured the volume of water transpired in relation to the growing environment and number of stomata.</p> <p><b>Methods/Materials</b> In order to obtain average stomata per square millimeter on each leaf, I painted clear nail polish onto the leaf's surface. This quickly created a cast of the leaf's surface. This method was thought of after unsuccessfully tearing the leaf in an attempt to view a sample of the thin layer on which the stomata are visible and using acetone to make an impression of the leaf's surface on the plastic slip cover. After the nail polish dried, I carefully removed a section of the cast using clear tape. I then placed sample under a previously measured microscope. I counted the number of stomata in five randomly selected areas and then found the average number. After all six plants had been tested, I placed a sample of the plant into a potometer to measure the amount of water taken up through the stem of a plant and therefore, the amount of water vapor released through it's leaves. I constructed a potometer. When the potometer was set up, I turned on an indoor growth light which was suspended above the potometer. After the plant was in a stopper at the top of an uncalibrated burette tube, I filled the apparatus with water so that a calibrated burette tube read 0ml. I then placed a small beaker over the calibrated burette tube so that no water would evaporate and affect my results.</p> <p><b>Results</b> In my tests, I found that plants that grew in full sunlight had more stomata than those that grew in shade. The plants that grew in partial sunlight had a number of stomata between full sunlight and full shade plants. In testing for the volume of water transpired in relation to stomata distribution, I found that, generally, the plants that grow best in full sunlight transpired the most and those that grow best in full shade transpired the least. The plants that grow best in partial sunlight transpired a similar amount to those that grow in full shade.</p>	
<b>Summary Statement</b> My project tests the relationship between growing environment, distribution of stomata, and water transpiration in plants.	
<b>Help Received</b> I Used lab equipment from the St. Joseph's science laboratory.	