



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> Quinn Costello	<b>Project Number</b> <b>J1707</b>
<b>Project Title</b> <b>Cut, Connect, and Grow</b>	
<b>Objectives/Goals</b> My goal is to produce a successful graft between different species of cacti. Studying grafting can add to research in the field of plant biology, and help expand knowledge in other scientific fields. For example, grafting is also used for medical purposes such as skin grafting for burn victims. My research in grafting cacti can hopefully spur others on to further research.	
<b>Abstract</b> <b>Methods/Materials</b> I first set up my cacti in their pots, and left them for a week to habituate them to the surrounding climate. Next, I cut each Cereus cactus 1-2 centimeters from the top (depending on what would make the diameter equal to that of its corresponding scion), and each Astrophytum Myriostigma and Gymnocalycium Calochlorum about 1 centimeter from the base. Once done, I placed each of my Astrophytum Myriostigma on top of its corresponding Cereus partner, aligned the inner cores, and placed rubber bands on top of the cotton balls (to alleviate pressure) over the graft. I waited a few weeks for the cacti's tissues to fuse together into a graft, occasionally misting the grafting cuts to prevent them from drying out and causing the cacti to die. Finally, once every 5 days I recorded the characteristics of my newly grafted cacti into my scientific logbook.	
<b>Results</b> All my cacti survived, except for 1 Astrophytum Myriostigma-Cereus cactus, which I believe died from a lack of moisture in the cut wound. By the end of my experiment, 2 remaining Astrophytum Myriostigma-Cereus cacti were 11.9 centimeters and 13.2 centimeters, and Gymnocalycium Calochlorum-Cereus cacti were all healthy, growing to heights of 7.9, 10.7, and 11.8 centimeters. They have since grown little, because in winter most species of cacti remain dormant.	
<b>Conclusions/Discussion</b> I conclude from my experiment that it is possible to achieve a successful graft between several different species of cacti using simple methods and materials. I learned that to achieve a successful graft the subject cacti must be consistently monitored to make sure the cuts do not become infected. I would change two things if I were to repeat the experiment. I would not use seedling cacti, but more hardy varieties. Secondly, I would graft in early spring so the cacti would not be dormant during the healing and tissue fusion period. These results can be linked to medical grafting. Just as plant tissue grafting is a precarious and long process, so is medical grafting.	
<b>Summary Statement</b> My project is about successfully grafting different species of cacti for the benefit of botanical and scientific research.	
<b>Help Received</b> None	