



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Sofia K. Lochner	Project Number J2019
Project Title The Effect of Centripetal Force on Plant Growth	
Abstract Objectives/Goals This experiment helps us get a better understanding of how plants react to what they perceive is gravity. When plants are subjected to centripetal force they react to the new direction of gravity by growing against it. To create centripetal force the plants were grown on a record player at 45(rpm)for 14 days. After 14 days on the record player, the plants grew at a horizontal 70° angle towards the center of the record player. This experiment concluded that plants grow against the vector sum of centripetal force and gravity. Methods/Materials Materials: Two growing dishes, Ten tomato sprouts, 7100 cu cm of potting soil, One record player, One lamp fixture, One sun lamp, One timer on light fixture, 10 ml of Miracle Grow, Ten labels, Five cooking skewers. Methods: Place the Experiment growing dish on the record player. Make sure the center is directly under the plant 5E. Turn record player on to 45 rpm. Results The plants that were spinning at 45 rpm on a record player for 14 days grew at a 70° horizontal angle. While the control plants grew at a 90° vertical angle. Their angle of growth was because they grew against the centripetal force created by the record player. Conclusions/Discussion I concluded that, when plants are subjected to centripetal force they react to the new direction of gravity by growing against it. The new effective gravity is the vector sum of centrifugal force and gravity in a non-inertial. In inertial frame of reference the plants grow against the centripetal force. As the radius of the plants from the center increases the horizontal angle of growth will decrease. As the plants grew towards the center, the centripetal force became less, thus the plants began growing at more of a horizontal angle towards the center.	
Summary Statement In this project I saw how plants angle of growth change when subjected to centripetal force.	
Help Received Robert Keolian taught equations and reviewed final project; Mother reviewed final project.	