



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Jeremy J. Alexander	Project Number J0201
Project Title What Is the Optimum Leverage Point to Achieve Maximum Distance with My Catapult?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project's goal was to determine at which pivot point of my catapult was the most effective to throw a golf ball the farthest distance.</p> <p>Methods/Materials My methods for testing are launching ten golf balls for each pivot point. There are three pivot points and each one is distanced one and one half inches apart. Pivot point C is 5 1/2 inches from the four pound counterweight and also is the closest pivot point to the counterweight. Followed by point C is pivot point B, which is 7 inches from the counterweight. Pivot point A is the farthest pivot point from the counterweight and is 8 1/2 inches away. Materials: Catapult Beam 26 1/2 inches Platform two feet length, one foot width Upright Posts with dowel hole, 15 inch height Dowel diameter 5/16 inch x one foot length Sling a 3 inch and 7 inch string and leather pouch (10) standard golf balls (10) 2 inch drywall screws (4) wheel casters</p> <p>Results My hypothesis of pivot point C launching a golf ball the farthest was correct. Pivot point A, however, had a much more consistent range of distances. Pivot point A's lowest distance was nineteen feet, while its highest was twenty-five feet. Pivot point C launched a golf ball twenty-six feet and several others in the low twenties. However some launches were unsuccessful. Pivot point C's lowest were four and thirteen feet. If you look at pivot point B, the distances were not good. Three launches went backwards. The other launches didn't go far.</p> <p>Conclusions/Discussion The reason why there were unsuccessful launches was because of the sling. The sling will release the ball at an unpredictable time. When the sling does an arch, one of the strings could be not tight enough to make a complete arch. Since the string was loose, the ball released too early and went backwards. The string may have also been too tight and performed the arch too long. This would make the ball go low and not go far.</p>	
Summary Statement My science project is about a trebuchet with three pivot points that launches golf balls and I want to know which pivot point will launch a golf ball the farthest.	
Help Received My dad helped me build the trebuchet.	