



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Payton Nance; Sameer Sundrani	Project Number J0123
Project Title The Flight Path of a Boomerang	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of our project is to determine how launching a two # winged boomerang at different angles affect the boomerangs flight path. We hypothesize that the boomerang will land farthest away from the point of origin, the skeet shooter, when the boomerang is launched at zero degrees, horizontal. When launched at forty degrees, the boomerang will land closest to the point of origin.</p> <p>Methods/Materials A skeet shooter was used to launch the boomerang at different angles ranging from 0 degrees horizontal up to 40 degrees. This skeet shooter was modified so that it was able to launch the boomerang at the correct strength and speed for it to fly in the correct manner. The boomerangs flight path and the distance it landed from the point of origin was recorded. In order to measure these distances, markers and a tape measure were used. Every time the boomerang landed, the tape measure was used to measure the distance away from the point of origin in meters.</p> <p>Results When launched at 0 degrees, the boomerang landed at an average of 34 meters away from the point of origin. The boomerang landed at an average of 37 meters away from the point of origin when it was launched at 10 degrees. When launched at 20 degrees, the boomerang landed at an average of 31 meters away from the point of origin. The boomerang landed at an average of 29 meters away from the point of origin. Finally, when launched at 40 degrees, the boomerang landed at an average of 27 meters away from the point of origin.</p> <p>Conclusions/Discussion In conclusion, these values support our hypothesis because our results showed that the boomerang landed closest to the point or origin when launched at 40 degrees, because the boomerang is not able to spin when launched at horizontal, and therefore will not get lift or the returning motion. When launched at 40 degrees, the boomerang is able to spin, creating lift and the returning motion needed for it to come back. It took many trials and four different modifications to determine the proper placement of the bolts on the skeet shooter to enable it to shoot boomerangs. We are planning to conduct additional trials and will have those results to present at the state science fair. Other variables, such as wind resistance, moisture, and the strength at which the boomerang is launched can be used in future investigations.</p>	
Summary Statement Our project is about #How does changing the angle a boomerang is thrown at affect its flight path?#	
Help Received My parents helped glue material on the board, they helped to modify the skeet shooter, and they helped us use the skeet shooter.	