



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Quinten R. Lu	Project Number J0115
Project Title Boomerang's Best Bends	
Abstract Objectives/Goals The purpose of this project was to find the combination of bend location and bend degree for the wings of a cross boomerang that produced a flight as close to parallel to the ground as possible. Methods/Materials Nine ponderosa pine cross boomerangs were constructed with equal mass, dimensions, and wing tip twists; however, the cross boomerangs had varying bend locations and degrees of bend. The bends were placed 1/3 or 1/4 of the distance in from the wing tip and were set to 0, 2.5, 5, 7.5, and 10 degrees. Each boomerang was given ten flights, which were timed, and rated on flight quality. Results The boomerang with the bend location 1/4 of the way in and a 2.5 degree bend had the shortest and most parallel to the ground flight. The boomerang with the bend location 1/3 of the way in and a 10 degree bend had the longest flight time and the furthest from parallel flight. The boomerang with the 0 degree bend consistently hit the ground before completing its flight. Conclusions/Discussion The boomerang that was closest to the objective of this project was the 1/4 of the way in, 2.5 degree bend. In boomerang competitions there are categories such as shortest flight time, longest flight time, and highest flight. The results from this project can help guide boomerang makers as they create boomerangs designed for the different competitive categories.	
Summary Statement I studied the effect of bend location and bend angle on boomerang flight.	
Help Received My parents helped in general ways (proof reading, assisted with testing boomerangs and board layout).	