



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> Celeste Amaya; Ashley Galvez	<b>Project Number</b>  34733
<b>Project Title</b> Project Pendulum	
<b>Objectives/Goals</b> Our objective was to determine what affects the period it takes a pendulum to swing and if the amplitude was the main factor. <b>Methods/Materials</b> In our first experiment we made a pendulum, adjusted its length, weight, and angle, to measure the effect the independent variables had on the period of the pendulum. This experiment demonstrated the importance of the length in determining the period of the pendulum. We then modified our experiment to isolate the variables and determine the effect of the amplitude on the period. We set a fixed length and weight to the pendulum and focused on the amplitude. <b>Results</b> Our results show that the length of the pendulum is the biggest factor in determining the period. After additional experimentation, we also discovered that the amplitude is a factor in determining the period, but the affect is smaller. <b>Conclusions/Discussion</b> We discovered that the pendulum has two factors which affect its period, the length and the amplitude. After completing our first experiment, the amplitude did not seem to affect the period, so we modified our experiment and extended the length so that we could measure and graph the effect of the amplitude.  When researching pendulums we found several formulas which graph the period from the length and/or amplitude. There were two formulas which we found most useful. The first was the simple pendulum formula that was in our text book and the other formula was a modification which included the addition of the amplitude as a variable. While the second formula was more precise and matched our results the best, it is the first formula that we believe to be the best for most applications.  After all the testing was complete, we found the averages of periods from our results matched closely with the theoretical value from the equations. This confirms the accuracy of our data, experiment, and our procedure. The amplitude does affect the period of the pendulum, but it is not the main factor.	
<b>Summary Statement</b> The length and the amplitude of the pendulum affect the period of the pendulum.	
<b>Help Received</b> Brother helped drill the hole in the board and mounted the pendulum on a ladder and on the ceiling wood beam.	