



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> Yuval Lifshitz	<b>Project Number</b> <b>J1817</b>
<b>Project Title</b> <b>What Affects the Motion of a Pendulum?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> In my project my goal was to see for myself if Galileo's claims about the dependence of a pendulum's period on mass, length and amplitude were correct.</p> <p><b>Methods/Materials</b> 10 weights (40 gr each), screw-eye pivot, string for the pendulum, Measuring tape (cm), protractor, and stopwatch for measurement.</p> <p><b>Results</b> I discovered that Galileo was only partially correct. He was wrong about the amplitude, even though I actually read that he noticed the changes in the period but he disregarded them.</p> <p><b>Conclusions/Discussion</b> I confirmed two of Galileo's observations regarding the period of a pendulum. I also measured the gravitational acceleration constant <math>g</math> and got a pretty good approximate value of 9.87 meters per second squared (about a 0.6% error from the known value of 9.81 meters per second squared). Also, I found that my hypothesis regarding the dependence on amplitude was correct, the period increases with the increase of the amplitude. It seems that Galileo was wrong, although according to some books, Galileo himself measured that there was a dependence on amplitude but did not believe it. Scientists today know that this dependence exists.</p>	
<b>Summary Statement</b> Measuring the dependence of a pendulum's period on its mass, length and amplitude.	
<b>Help Received</b> my parents helped me construct the pendulum and perform the measurements, and they proof-read my paper: My sister allowed me to use her eleventh grade physics book.	