



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Steven H. Park	Project Number J1914
Project Title Proving Universal Gravitation by Warping Space-Time	
Abstract Objectives/Goals The objective of my project was to determine if two masses would attract each other through the force of gravity, as predicted by Isaac Newton's law of universal gravitation. Methods/Materials I built a rudimentary Cavendish-style experiment to control the variable caused by earth's gravitational influence. First, I suspended a slim horizontal beam above ground by a nylon wire. At each end of the beam, I placed a 1 pound lead mass, making certain the beam remained level, plumb, and stationary. On the floor and at the same height as the suspended smaller masses, I placed a 6 pound lead mass, experimenting with the distances at which each larger mass was placed away from its respective smaller mass. The distances ranged from 3 to 6 inches. To prevent movement by any other force other than gravity--e.g., air or vibration, I covered the experiment with a sheet of plastic, turned off the thermostat, and prevented people from entering the room. I watched remotely the experiment via video. Results What I found, both mathematically and observationally, is that the closer the objects were to each other, the stronger their gravitational force. And conversely, the further the objects were from each other, the weaker their gravitational force. I discovered through trial and error that a 1 pound lead mass suspended in air will be attracted to a 6 pound lead mass only if they were less than 3 inches apart. Any distance further apart and the smaller masses were motionless. Conclusions/Discussion I concluded that Newton's theory of universal gravity is correct, that all bodies attract each other with a force of gravity directly proportional to the product of their masses and inversely proportional to the square of their distances.	
Summary Statement My project proves that two masses will attract each other through the force of gravity, as predicted by Newton's law of universal gravitation.	
Help Received Father helped explain some concepts and proofread/typed my report.	