



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Ethan T. Gomer	Project Number J1808
Project Title Marvelous Magnetics: Do Opposites Always Attract?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment was to determine how graphite, paper, plastic, aluminum foil, or no material would affect levitation using diamagnetism. My hypothesis stated that the graphite would require the least amount of distance lowered for the lifter magnet because graphite is one of the strongest diamagnetic materials, compared to the control would require the most distance for the lifter magnet to lower, and lift the floater magnet because there is no diamagnetic material to support it in its levitation process.</p> <p>Methods/Materials To conduct this experiment, I placed the levitation pedestal on a flat surface with no magnetic items nearby. I then placed the graphite on the lower arm of the pedestal and placed the floater magnet on top of that. Next, I slowly turned the adjustment screw until the floater magnet started to levitate, and then flew upward. I repeated but with the other materials, which are paper, aluminum foil, and plastic in place of the graphite. When I finished the tests with the remaining materials, I then took off the remaining material, and tested the experiment with the control.</p> <p>Results The results of the experiments were diverse. In this case of results, the lower the number, the stronger the diamagnetic forces in the material. The tests involving no material and the aluminum foil both ended with the same results, and the same average of 12 mm. Also as strange, the plastic material ended with an average of 12.1 mm. The graphite ended with the least distance of 10.2 mm, and the paper with 11.7 mm.</p> <p>Conclusions/Discussion The hypothesis that I made that stated that graphite will be the shortest distance whereas the control being the longest distance in terms of the most assistance the lifter magnet has to give, was correct. My hypothesis on terms of the graphite being the most diamagnetic material was correct, where as having no material was equal to having aluminum foil, and lower than plastic by . 1 mm, but shows the difference between different materials. This experiment could also connect to the world in the reference of how many man made objects today use magnetism or even diamagnetism. For example, the fastest train in the world is in Japan, and runs on magnetism.</p>	
Summary Statement My project was to determine how graphite, paper, plastic, aluminum foil, or no material would affect levitation using diamagnetism.	
Help Received Ms. Fisher provided amazing guidance for the project and notebook; Mrs. Diaz provided guidance for my research report and annotated bibliography; My mother helped me lay out by board; My father helped me organize the project, experiments and notebook.	