



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Jackson D. McKay	Project Number S1920
Project Title Swingin'	
Abstract Objectives/Goals How will different gasses resist the motion of an object? I believe that the denser the gas is, the more it will resist the motion of an object. To test this I will have a small air tight chamber that we can pump gases into. In general, a denser gas should slow an object, as it will produce greater friction. However, some people may argue that on the pendulum's up swing, the denser gas below may allow for more lift. This isn't true, and even if it was, it would fight the same force when coming down. Methods/Materials Procedure: 1. Build a small air tight chamber made of a jar and wood base that we can evacuate gases into. The chamber must be clear so I can see into it. Inside the chamber will be an iron pendulum. 2. Place an optical motion sensor inside the chamber placed so its beam travels through a point slightly before the pendulum's rest point. Each time the pendulum passes through, it will trigger a tone so the number of swings can be counted. 3. Pump the gas in and seal the chamber. 4. Tilt the chamber on its side, the pendulum will make contact with the side, and put a magnet on the outside of the chamber to hold the pendulum in place in. Note its position in order to have a respectable and equal amount of potential energy stored in the pendulum in all tests. 5. Once the chamber is put upright and all movement has stopped, release the magnet and the pendulum will begin to swing. 6. Time how long it swings 7. Do several tests with different gasses (and a vacuum) and different pressures. Regular air will be the control. Materials: Large Glass Jar; Base Wood; Rubber; Pressure gauge; Pendulum (ferrous metal); Magnet; Optical motion sensor; Air Compressor; Plain air; Helium; Carbon Dioxide; Carbon Dioxide-Argon mix. Results The data shows a clear correlation: The denser the gas, the shorter the time that the pendulum will swing for. Conclusions/Discussion The data shows a clear correlation: The denser the gas, the shorter the time that the pendulum will swing for.	
Summary Statement I wanted to determine how a pendulum will swing differently in different gases.	
Help Received My father helped build the device, and he helped make the graphs	