



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

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| Name(s) Jeremy D. Ray | Project Number J0825 |
| Project Title Do You Want to Go for a Spin? | |
| Abstract Objectives/Goals This experiment investigated how a simple electric motor's size affects speed. The hypothesis stated that a bigger coil will run slower because it has farther to turn. Methods/Materials An electric motor was built using the instructions at www.sciencebuddies.com . The rotational speed was measured ten times for each coil size by winding a thread on one arm of the spinning copper coil and measuring the average string winding coil diameter. Rotational speed was calculated by converting the string winding diameter to circumference and dividing it into the known string length(200 cm) to find the number of windings in a measured length of time. this yeilds revolutions per second. Results Coil 1 (1.2 cm diameter) ran the fastest at 15.2 revolutions per second(rps). Coil 2(1.5 cm)ran the slowest at 9.6 rps. Coils 3 (2.8 cm) and 4 (2.0 cm)were close together at 12.9 rps and 13.8 rps, fairly close to Coil 1. Conclusions/Discussion The data didn't show any clear relation between coil diameter and speed although the smallest coil ran the fastest. Interaction between the electromagnetic field created by current flowing through the coil and the magnet's magnetic field causes the coil to spin. If the strength of the electromagnetic field is not dependent on coil diameter, then there would be no relation between data sets could have been caused by a minor variations in the motor construction and testing procedures. | |
| Summary Statement Four coils of different diameters were tested to determine if the size of the coil affected the revolutions of the coil. | |
| Help Received Father helped in building the motor construction, father helped with setup of board and supervised use of knife and wire cutting | |