



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

Christopher L. McCormick

Science Fair Use Only

J0621

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Can Electromagnets Propel A Model Vehicle?

Division

J Junior (6-8) J Senior (9-12)

Preferred Category (See page 5 for descriptions.)

6 - Electricity & Electronics

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

PURPOSE: The purpose of this project was to determine the magnet size, vehicle size, power requirements, and others factors necessary to propel a model car with electromagnets.

RESULTS: It was possible to propel a model car with a weight of 230 grams and a length of 17.75 centimeters using electromagnets constructed of bolts 5/8 of an inch in diameter and 3 inches in length (metric measurements would be inaccurate in this case), wound with 24-gauge wire and powered by 12 volts and 2.5 amps. The metal strip on the bottom of the car needed to be about 1.5 centimeters from the magnets. It was possible to propel the car only if the magnets were #fired# at the right speed using a hand-powered switch. With smooth firing, acceleration increased from one magnet to the next.

CONCLUSION: It is possible to propel a model car smoothly using electromagnetic propulsion, given the right conditions. #Firing# the magnets via computer might be a way to get the vehicle to move reliably and at a constant speed.

APPLICATIONS: Because acceleration can increase from one magnet to the next, if firing of the magnets could be automated, this propulsion system could be used to launch model airplanes.

Summary Statement (In one sentence, state what your project is about.)

My project shows that electromagnets can propel a model vehicle, given the right magnet size, vehicle length, magnet firing speed and other conditions.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Richard Ingalls explained how electromagnets work and helped me design my test platform. Diane Ingalls edited my report. My parents purchased supplies for the project and gave me their support and encouragement.