Name(s)	Project Number
Benjamin J. Giglione	**J0715**

Project Title

Can a Braitenberg Vehicle React to Sound?

Abstract

Objectives/Goals
This study compared the behavior of a Braitenberg vehicle equipped with light sensors to a vehicle equipped with sound sensors. A Braitenberg vehicle is a light sensing robot used in synthetic psychology (the study of robots that mimic behaviors founded by Valentino Braitenberg in 1984). These vehicles can follow and run away from vibrations the robot's sensors sense. Can these vehicles react to sound?

Methods/Materials
Using Lego Mindstorms 2.0 standard programming interface, a new program was written. A second program with similar functions had been written in the NQC (Not Quite C) language. First the computer was programmed to run toward/away from light as Braitenberg described using both programs. New sensors were built, as the variation, to similarly cause the vehicle to run towards/away from sound with both programs.

Materials included custom made Mindstorms sound sensors, one extra Lego light sensor, a computer to download the programs to the Mindstorms RCX brick, a USB tower to send the program to the robot, a flashlight, and a strong sound source such as a human voice or and a portable music player with speakers.

Results
The vehicle test runs evaluated the ability of the robot to function with the various sensor and program combinations. Sensor wise, the robot responded similarly to both programs, reacting to the type and intensity of stimuli each sensor was specifically designed to detect. With the light sensors, the robot responded to light sources and when using sound sensors, the robot reacted to sound. A strong stimulus either attracted or repelled the robot depending on the programming or hardware configuration.

Conclusions/Discussion
It shows the Braitenberg vehicle's behavior is similar when using either light or sound sensors. Vehicles may be programmed to react to stimuli other than light. These synthetic behaviors can have a wide variety of theoretical and practical applications.

Summary Statement

A robot that runs towards or away from light can be made to do the same with sound.

Help Received

Used robotics equipment at Portola Middle School under the supervision of Mr. South. Father helped build sensors. Mother helped type report. Mrs. Shah helped develop project.