CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
Helena Epps; Joe Raimondi

Project Number
J1810

Project Title
Efficiency Deficiency

Abstract

Objectives/Goals
Estimates of the degree of fuel that is not combusted in a typical 4-stroke engine ranges from 5-20 percent. With gas prices rising and oil supplies dwindling, the need for fuel efficiency rises. Our purpose is to determine whether any gas saving treatments actually have beneficial effects on fuel efficiency. Specifically, we asked how different types of gas saving treatments affect the mileage of a 4-stroke engine? We predict that compared to regular gasoline, additives will perform the best, a modified spark plug next, followed by heated gasoline, and then fuel line magnets, which will perform the same as regular gasoline (the control).

Methods/Materials
To test our predictions, we built an apparatus consisting of a 6.5hp engine coupled to a wheel and odometer. We used 87 octane gasoline. We tested 5 gas saving treatments: fuel additive, fuel line magnet, modified spark plug, fuel line heating pack, and control. For each trial, we used 50 milliliters of gasoline and one of the five gas saving treatments. We ran five trials of each treatment in a series of the five treatments in a row.

Results
Some of the treatments improved fuel efficiency. Heated fuel was the most efficient (5% greater than the control), followed by the modified spark plug (+4%), the gasoline additive (+1%), the control, and finally the magnet (5% decrease).

Conclusions/Discussion
Our results did not support our hypothesis in the order of effectiveness, however they do suggest that there are ways to increase fuel economy. Next time we would like to try combining the treatments to see if we could get a better result. We would also try to find a way to use the heat from the engine to heat the gas in the fuel line.

Summary Statement
We investigated the effects of different gas saving treatments on the fuel effficiency of a 4-stroke engine.

Help Received
Parent helped with spread sheet and graphs, science teacher edited and made comments on the report.