CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY

Name(s)

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Project Number

J0107

Project Title

How Different Types of Gases Affect Balloon Rocket Speed and Distance

Abstract

Objectives/Goals

Our science fair project is based on the investigative question we came up with: How will different types of gases affect balloon rocket speed and distance? Our hypothesis was that the gas helium would make the balloon rocket go the fastest and farthest because according to the background research we found out that helium was the least dense out of the four types of gases we used: CO2, helium, atmospheric air, and difluoroethane. Because helium was lighter it would move faster.

Methods/Materials

We made a balloon rocket using a straw connected on a string, suspended by two chairs. Balloons inflated with the different gases (CO2, helium, atmospheric air, or difluoroethane) were taped to the straw. Balloons were blown up to 41 cm circumference with each of our four different gases (CO2, helium, atmospheric air, or difluoroethane) and the rockets were let go. We recorded the run using video to confirm the time the balloon traveled and measured the distance it traveled from the start. We did 10 trials for each gas.

Results

Our results for the average speed was 216.95 cm per second for CO2, 152.25 cm per second for helium, 303.24 cm per second for atmospheric air, and 274.54 cm per second for difluoroethane. Shockingly even though difluoroethane was almost 16 times heavier than helium, difluoroethane went the farthest out of all the other 3 gases. Helium went 187.45 cm, air went 379.48 cm, CO2 went 446.53 cm, and difluoroethane 608.08 cm.

Conclusions/Discussion

There was no relationship between the average speeds and the weight of the gases. That is what made our hypothesis incorrect. The distances were larger when the gases were heavier. There was a direct linear relationship between the weight of the gases and the distance the balloon rocket traveled.

Summary Statement

From our study, we found there is a direct linear relationship between the weight of gases and how far those gases can propel a balloon rocket.

Help Received

Our science teacher, Mr. Cady, reviewed our project plans and results.