SCIENCE FAIR PROJECT

ROCKET CANDY!

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ABSTRACT

At a school where rockets are everywhere, aerodynamics of rockets would be a cool way to spread the spirit of SLA. In the year of 2013, the aerodynamics project was tested, the experimental design was to test 3 rockets with three different shapes but the same rocket fuel. That experiment had many failures, for one, the rockets didn't even launch. Learning, observing and discussing, a second attempt to this project is about going to lead the way.

Today there is a program called the Sugar Shot to Space Program. The "underlying goal of the Sugar Shot to Space program is to loft a rocket powered by a 'sugar propellant' into space." The goal is for a rocket with a sugar-based motor to make it into space, or 100 km (62.137 mi) high. The Extreme Sugar Shot rocket, the rocket expected to meet the goal of entering space, has not yet been completed and is a work in progress. Through my work hopefully this will lead the way to rocket candy being launched into space.

HYPOTHESIS

The rocket candy containing rust powder will have the longest burn time.

EXPERIMENTAL DESIGN

Variables:

Controlled variables: Type of fuel, additives, oxidizer, temperature of heat, angle held above the surface.

Independent variable: Additives, Oxidizer

Dependent variable: Time flame lasted

Groups:

Control group: Fuel, Oxidizer

Experimental group #1: Fuel (sugar), Oxidizer (potassium nitrate), Additive (water).

Experimental group #2: Fuel (sugar), Oxidizer (potassium nitrate), Additive(water, corn syrup).

Experimental group #3: Fuel (sugar), Oxidizer (potassium nitrate), Additive(water, corn syrup, rust powder).

EXPERIMENT - THE VIDEO

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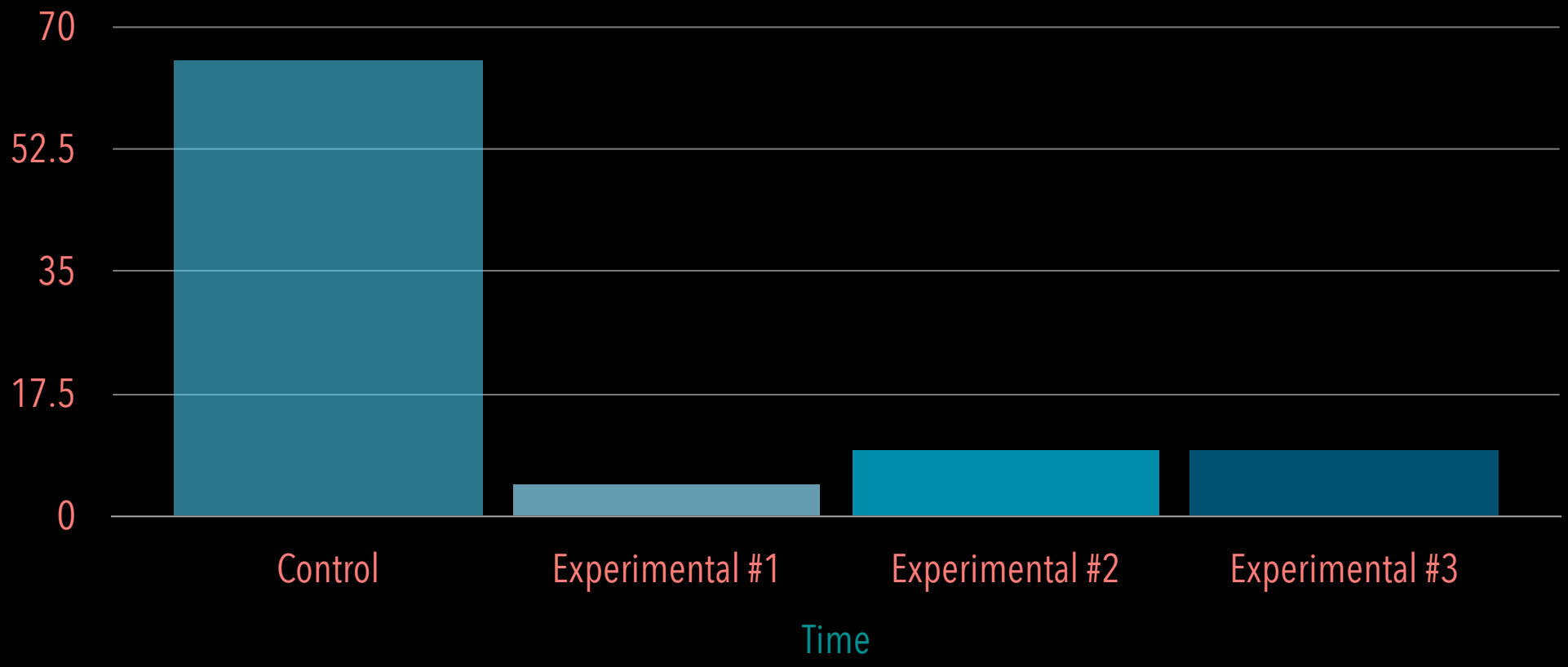
RESULTS - DATA

GROUPS	TIME
CONTROL: (SUGAR, POTASSIUM NITRATE	65
EX. #1: (SUGAR, POTASSIUM NITRATE, WATER	4.5
EX. #2: (SUGAR, POTASSIUM NITRATE, WATER, CORN SYRUP	9.6
EX. #3 (SUGAR, POTASSIUM NITRATE, WATER, CORN SYRUP, RUST POWDER	9.5

RESULTS


70
52.5
35
17.5
0
Control
Experimental #1
Experimental #2
Experimental #3
Time

RESULTS - OBSERVATIONS

- All of the flames were a bright pink color.
- Control Group
  - Flame came out of the bottom.
  - The flame stayed mostly in one place, there wasn't a big explosion or bang.
- Experimental group #1
  - A bright pink flame shot out of the bottom.
  - It spiraled out of control off from the clamps.
  - It released a bright pink explosion and then massive amounts of thick grey smoke.
- Experimental #2
  - Immediately let off massive amounts of thick grey smoke.
  - Smoke bright pink flames could be seen.
- Experimental #3
- Flame shot off from top and bottoms.

DISCUSSION

The results of the experiment showed that the rocket candy with the rust powder gave off a fast and powerful flame. The reason for that being is that metal oxides have been found to increase the burn rate of sugar propellants. Most often used are iron oxides. Red iron oxide is used most often as it is somewhat easier to obtain than the yellow, brown, or black versions. Brown iron oxide exhibits unusual burn rate acceleration properties under pressure.

CONCLUSION

In conclusion, my hypothesis was not not supported. It thought that the rocket candy containing the rust powder would burn the longest but it was actually the rocket candy that contained just potassium nitrate and sugar. However it was realized that the time the rocket candy burned was an efficient way to measure the rocket fuel, calculating the power of the flame would have been more efficient.

Since this experiment will be continued, the next step of this process is to make the body of the rocket. However if the modification of the rocket fuel was continued, another addictive would be added to the fuel that would reduce the amount of smoke but increase the power of the flame.

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