



Colorado Science and Engineering Fair

2024 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Biomass to Biogas

Finalist's Name: Paisley Wiersma

School and City: Genoa-Hugo, Hugo CO

Sponsor's Name: Casey Wiersma

Category: Earth & Environmental Sciences (EAEV)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

The purpose of this project is to see what biomass creates the most biogas in 12 days. Biogas is a renewable fuel that's produced when organic matter called biomass, like animal waste, food scraps and other organic matter is broken down. This is important because what we think is "just garbage", may actually be able to help run our everyday lives cleaner and more efficiently. Biogas is made when a combination of methane, hydrogen, and carbon dioxide is produced by the decomposition of organic matter by bacteria in the absence of oxygen. Based on this information, the hypothesis of this experiment is that the bottles containing vegetable peels and cow manure will produce the most gas in 12 days. The tables and graphs show the bottles labeled Cow Manure + Vegetable Peels did not show any sign of gas until day 12 and only inflated to a circumference of 11cm. The bottles labeled Cow Manure did not show any growth or circumference during the 12 days. However, the bottles labeled Mashed Banana + Cow Manure performed the best and first showed growth on day 3 and inflated to a greater circumference of 22cm. In conclusion, the experiment did not support my hypothesis. The bottles labeled Cow Manure + Mashed Banana first showed growth of biogas by day 3 and had a maximum circumference of 22cm. The bottles labeled Cow Manure + Vegetable Peels under performed and did not produce biogas until day 12 with a maximum circumference of 11cm.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with your Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.