



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: Biodegradable or Not? Trial by Fire

Finalist's Name: Elise Gavin

School and City: TCA North, Colorado Springs

Sponsor's Name: Dawn Ehresman

Category: Earth & Environmental Sciences (EAEV)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

Biodegradable or Not? Trial by Fire

by Elise Gavin

Abstract

The purpose of this experiment was to test to see if biodegradable plastics really degrade. To do this, I weighed different consumer materials, such as plastic, paper, and biodegradable plastic straws, cups, and lids on an analytical balance and buried them in four different environmental conditions that included sand, salt water, dirt, and compost. I kept these materials in these conditions and checked water pH, moisture content, and temperature every other day for three months. At the end of this time, I uncovered the materials and weighed them once more and compared the weights to see how much they degraded. Surprisingly, many of the degraded materials weighed more than they did originally. To measure decomposition another way, I made a calorimeter and burned each material and measured how much it made water temperature rise. I compared this to the temperature increase caused by undecomposed control items. Again, the controls were less impressive, often producing less energy than the degraded materials. I found that neither calorimetry nor weighing the items before and after were sufficient ways to measure decomposition.

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: *Elise Gavin*

Date: *4 March 2024*

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.