



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Anna D. Singer	Project Number J1020
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Project Title
Warm It Up! Grass or Fruit Cup? Do Grass Clippings or Fruit and Vegetable Waste Create More Heat Energy in a Compost?

Abstract

Objectives/Goals
The purpose of this experiment was to see if grass clippings or fruits and vegetables create more heat in a compost pile. When I was in 5th grade, we had a compost bin at school, and it heated up a lot, so I was wondering what I could do to make it heat up more. Also, French innovator Jean Pain developed compost-based energy to create all the energy he and his wife needed to live on their farm. For the purpose of my project I wanted to see which one would be most effective for the Jean Pain method: grass or fruits and vegetables.

Methods/Materials
First, I made two compost bins by taking garbage cans, cutting off the bottom, and drilling holes on the sides. Next, I set up the compost bins by putting the bins on dirt and layering them with the carbon (woodchips) and nitrogen (fruit and vegetables/grass). I then waited a day and measured the temperature of the composts by taking two tin cans, pouring 200mL of water in them, and placing them in the middle of the compost to record the temperature. I repeated that step 14 times. Every couple of days, I aerated it by using a compost aerator and shovel to make sure the whole compost received air. Then I converted all my temperature measurements into heat energy.

Results
The results of my experiment showed that grass clippings as the nitrogen source in a compost pile produced more heat energy than fruit and vegetable waste. Heat energy from the grass clippings compost bin was higher than the fruit and vegetable bin for 14 of 15 days.

Conclusions/Discussion
My hypothesis that fruit and vegetable waste would release more heat energy than grass clippings in a compost pile was proved false. I think the reason why the fruit and vegetables did not produce as much heat is because the grass is smaller, so there is more surface area, which helps the bacteria decompose the materials. If I were to change my experiment, I would a) add more carbon because the grass compost did not have many woodchips left in it after about a week and b) have larger composts because the one made by Jean Pain was 80 cubic meters, about 661 times bigger than mine, and his compost got much hotter.

Summary Statement
To investigate if grass clippings or fruit and vegetable waste create more heat energy in a compost pile.

Help Received
My dad helped me by showing me how to use an electric drill and a lawn mower. My mom helped me ask friends, local supermarkets, and Sky Chef for produce waste.