



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

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**Project Title**

**Garbage Is a Waste: An Experiment to Determine if Garbage Can Be Used to Generate Electricity as a Benefit to Society**

**Abstract**

**Objectives/Goals**

The objective is to determine if a flammable gas can be produced from decaying garbage.

**Methods/Materials**

This study simulates decaying garbage by using pre-soaked pinto beans sealed inside two plastic zip-lock baggies to create an air-tight environment. Three sets of samples were prepared; the first set of pinto beans was placed in direct sunlight, the second set was placed in a shady area, and the last set was placed in a dark area. These samples were used to examine the effect of sunlight and temperature on decaying garbage. Gas production and ambient temperature data were gathered on a daily basis. After observing that the gas production had peaked, the baggies were held over a lighted candle to see if the gas produced was flammable.

**Results**

Graphical results, produced from daily observations, indicate that pinto beans produce a gas and produce more gas when placed in sunlight and at higher outside temperatures. Photographic results indicate decaying pinto beans produce a flammable gas.

**Conclusions/Discussion**

My hypothesis is that decaying garbage creates flammable gases because garbage has a foul smell which could be created by flammable gases. Graphical results support this hypothesis because the plastic baggies containing decaying pinto beans bulged over time indicating gas formation. Photographic results show that when the baggies were held above a lighted candle, there was some additional flame that was probably caused by the gas because the bags with the most gas had more flame. My experiment expands our knowledge because it indicates garbage (pinto beans) can be used to make electricity. Disposing of garbage without using it for environmentally beneficial purposes is a waste.

**Summary Statement**

My experiment was to learn whether decaying garbage can produce a gas, what environmental conditions produce the most gas, whether the produced gas is flammable, and finally speculate whether such gas can be used to produce electricity.

**Help Received**

I discussed how to organize my daily observations with my parents. For safety, my parents helped me with testing the combustibility of the gas produced from the beans and simultaneously taking still photographs of the flames.