



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Aamna J. Abbasi</b>	<b>Project Number</b> <b>S1101</b>
<b>Project Title</b> <b>Let's Get Drastic with Plastic... Again! Year II</b>	
<b>Abstract</b> <b>Objectives/Goals</b> For last year's experiment, after I visited a landfill to explore ideas that I could address through an experiment. I was told that if I found a way to help get rid of the plastic coming into the landfills, I would be doing a great service to society! So I began to look into plastics that are marketed as biodegradable, because if plastic is going to end up in a landfill anyway, why not use something that won't have a negative environmental impact? I explored biodegradable plastics, and came to a preliminary conclusion, but continued my research. I added a consumer analysis. I did an evaluation to determine the market availability of these products, and to evaluate the performance of these bags to meet the average consumer's needs.	
<b>Methods/Materials</b> 32 Air-tight Mason Jars, 32 grams of Plastic Trash Bags, Weigh scale, Substrates, Syringe with needles, Computer with Microsoft Excel, Infrared Gas Analyzer, Isotope Analysis. My experiment consisted of measuring 1 gram of each plastic sample with ~5 mls of four substrates representing common environmental conditions. The samples were placed in mason jars, and an infrared gas analyzer was used to measure carbon dioxide over time. There was one sample of each of the four plastics in a mason jar, with each of the four substrates, along with a duplicate. Leading to a total of 32 jars where the carbon dioxide was measured over a period of two months. Then a radioactive isotope analysis was conducted on each bag. I conducted a usability test based on data collected from over 50 households.	
<b>Results</b> For the biodegradability component, the oxo biodegradable additive plastic was the front runner and clearly had higher carbon dioxide concentrations. For the cost analysis, the plastic with the organic additive was the cheapest and the plant-based plastic was the most readily available in the market. For the usability test, the organic additive plastic was most successful.	
<b>Conclusions/Discussion</b> I believe based on each of these tests, the plant-based plastic would be the best option; balancing both consumer and environmental needs.	
<b>Summary Statement</b> Evaluating the biodegradation, cost, and consumer usability of biodegradable plastic bags.	
<b>Help Received</b> Dr. Claudia Czimczik allowed me to use laboratory and work with her over the summer. My grandmother who is battling cancer gave moral support. My mother and family helped with general inquiries. LOVE YOU ALL :)	