CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
Samantha Jean Beckett

Project Number
J2203

Project Title
The Effect of Reusable Bag Type on Tensile Strength, Liquid Retention, Stability, Washability, Compactness, and Capacity

Abstract

Objectives/Goals
The objective of this investigation was to deduce which reusable grocery bag was the most suitable replacement for a standard paper bag. This was determined through a serious of six tests, which took place over the course of two months.

Methods/Materials
Seventeen reusable grocery bags were collected, which varied in fabric, make, and design. These bags were tested to determine if they would withstand the maximum 30 lb. weight given in tensile strength (machine used), retain liquid without leaking, be stable in a moving automobile, wash without wear to the bag, compact into a small form, and have a great capacity. These aspects were individually investigated through six in-depth tests. Tensile Strength: 100 lifts each, with varying weight loads, 5 trials. Liquid Retention: 57 grams of liquid in each bag, 15 minute duration, 5 total trials. Stability: 10 defined maneuvers in a moving vehicle, avg. 1:12 min each. Washability: wash and dry per instructions, 5 trials. Compactness: 8 different size drink cups, bags compacted to fit with lid secured. Capacity: 6 distinct trials, different grocery item groupings.

Results
The results of the data collected showed that bags A-O consistently tested predominately over the standard paper bag. Although one single bag did not prevail in every test, the majority proved to be efficient, and consumer friendly. The three leading reusable grocery bags were the iTySE Ripstop Bag, the OBOE Pongee Poly Bag, and the ACME Bag Earthtote. These bags all prevailed in four out of the six tests.

Conclusions/Discussion
Much was learned from this experiment. It is evident that single-use grocery bags have a terrible effect on the environment. Not only are they a large danger to the natural world, but also destroy many valuable resources. If shoppers convert to using any one of these bags tested (except the paper and plastic bags), millions of paper and plastic sacks will be kept out of landfills. Therefore, it is very important that consumers adopt a new habit, and make the switch from single-use shopping bags, to reusable ones. They are not only a smarter choice for the environment, but also prove a more efficient one.

Summary Statement
The purpose of this investigation was to determine which reusable grocery bag was the most suitable replacement for a standard paper bag.

Help Received
Father photographed the experiments. Mother drove the Stability Test car and let me borrow her food scale, luggage scale, and digital frame.