



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Jenna Brandt	Project Number J1303
Project Title Better Balloons: Creating Balloons with Eco-Friendly Materials to Reduce the Harm of Latex and Mylar to Aquatic Habitats	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to construct balloons that biodegrade in water faster than Latex or Mylar balloons to reduce the harmful impact to marine and freshwater habitats.</p> <p>Methods/Materials Research was conducted online to find seven alternative materials which meet ASTM D6400, ASTM D6954-04 and/or EN13432 standards for biodegradability. These materials, along with Latex and Mylar, were tested for four months to see how well they biodegraded in sea and pond water. Balloons were made by cutting two circular pieces of each material and ironing the edges. They were tested to see if they held helium, and whether and how well they floated. The materials tested were: Bag to Nature (made from a "blend of organic biopolymers which degrade completely and are fully biodegradable and compostable"), BioBag (a corn-based product, made from "starches derived from plants, vegetable oils, and compostable polymers"), BioTuf (made from recycled plastic and is 100% compostable), Cello Bags (made from "clear, 100% compostable cellophane, a cellulose product derived from wood fibers"), Natural Value (recycled plastic which "returns the organic carbon back to the natural bio-cycle"), NaturBags (made of "biodegradable polymers, natural polymers, organic and inorganic materials which are reactively blended"), and PrideGreen (made of recycled plastic and "degrades, then biodegrades, on land or at sea").</p> <p>Results Cello Bags biodegraded the best in both sea and pond water. All materials except Mylar and Natural Value showed some biodegradation. Natural Value held helium and had the longest elapsed time suspended in air, 170 minutes. PrideGreen held helium and floated for the second longest time, 101 minutes. Biobag and NaturBags floated for only a few minutes. BioTuf, Bag to Nature and Cello Bags did not float.</p> <p>Conclusions/Discussion PrideGreen was the most successful alternative material overall. It held helium for 101 minutes, but when tested in a larger size was able to float for much longer. It is made from recycled materials and showed some biodegradation. Surprisingly, it could be tied and then untied, making it reusable, a capability neither Latex nor Mylar balloons have. Cello Bags was by far the best at biodegrading, but did not float. Cello Bags could replace the Mylar balloons which are attached to sticks and placed in potted plants. These materials show promise for new, earth-friendly balloon options. Better Balloons!</p>	
Summary Statement The purpose of this experiment was to construct balloons that can provide earth-friendly alternatives to Latex and Mylar and reduce harm to marine and freshwater habitats.	
Help Received My parents supervised me when I was using the iron.	