



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Romy Greenwald	Project Number J1306
Project Title Testing the Decomposition of Alternatives to Plastic Drinking Straws Under Simulated Environments.	
<p style="text-align: center;">Abstract</p> <p>Objectives My objective was to identify eco-friendly straws that decompose efficiently in natural environments. I hypothesized that straws with a lower mass and higher cellulose content would biodegrade most efficiently.</p> <p>Methods I tested paper, hay, bamboo, polylactic acid, (PLA) and sugar cane husk straws in water, ocean water, hydrochloric acid, compost and a control in an empty test tube. The straws were immersed for 30 days then removed and set out to dry for 48 hours. Each straw was weighed before and after the experiment to determine how much it had decomposed.</p> <p>Results On average, the hay straws decomposed more than any other straw in three out of four of the simulated environments. Their mass decreased by 61% in compost, 25% in tap water, 18% in hydrochloric acid and 14% in ocean water. The majority of the straws decomposed more efficiently in compost. PLA straws decomposed the least in all cases.</p> <p>Conclusions The results show that lighter organic materials decompose more efficiently than heavier straws and polymer based straws. This likely because they are fragile and more easily broken down and consumed by decomposers. The data showed that cellulose content affected the rate of decomposition but was not the only factor accounting for rate of decomposition.</p>	
Summary Statement I tested the decomposition of alternatives to plastic drinking straws under simulated natural environments.	
Help Received I consulted with James Radich, a technical director at Respirtek in Arkansas. Respirtek conducts biodegradability testing. I requested and received sample straws from numerous companies that I used in my experiment.	