



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

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<b>Project Title</b> <b>Decomposition of Foam Cup Alternatives</b>	
<p align="center"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose was to observe and measure the decomposition of natural alternatives to polystyrene products. The plastics were made with starches or flours with natural ingredients to create an environmentally friendly product. I hypothesized the corn starch alternative would have the greatest decomposition since it would create a softer and flexible product ideal for decomposition.</p> <p><b>Methods/Materials</b> The natural alternatives were created with 15mL glycerin, 120mL water, 10mL of vinegar, 6 grams of baking soda and 15 grams of one of the five starches or flours. The ingredients tested were corn starch, wheat flour, rice flour, potato starch and tapioca starch. All of the ingredients were mixed and heated to create a clear solution poured onto wax paper and dried in the sun for 3 days. Each of the five plastics were made three times and labeled. The mass as well as qualitative observations were collected before placed in the compost bin. The compost bin was built with alternating layers of carbon-based and nitrogen-based materials with soil for decomposition. All plastics were placed in the compost bin and were observed and measured every 3 days for a 21 day period.</p> <p><b>Results</b> The wheat flour plastic obtained the highest average of decomposition of 50.5% through the time period. The lowest averages were the tapioca starch with 32.24% decomposition and potato starch with 30.8% decomposition. The percentages show how much and fast each plastic decomposed in the time period.</p> <p><b>Conclusions/Discussion</b> The results refuted my hypothesis since corn starch resulted in a thick and inflexible plastic that had the third highest decomposition but the potato starch plastic was supported in the lowest decomposition. The wheat flour overall resulted in the fastest product decomposed than the other ingredients. The knowledge of the decomposition of the alternatives of foam cups may lead to a possible way to create an environmentally friendly product.</p>	
<p><b>Summary Statement</b></p> <p>The decomposition of alternatives to plastic made with flours and starches was observed and resulted in the wheat flour being the quickest.</p>	
<p><b>Help Received</b></p> <p>I created the plastics but received help in building the compost bin from father. My environmental teacher helped in project ideas and methods.</p>	